# WESTERN GAS

FEB 13 1935

● THE Robertshaw Thermostat Company, since 1899, has specialized in the manufacture of gas thermostats. During these thirty-five years, the Robertshaw Laboratory, enlarged each year, has been continually engaged in the development and improvement of thermostatic controls.

● No controls are offered to the gas range industry by Robertshaw that have not been rigorously tested and proved. The result has been inevitably that throughout the years gas Ranges equipped with the Robertshaw have been signally free from servicing troubles so far as the oven heat control is concerned.

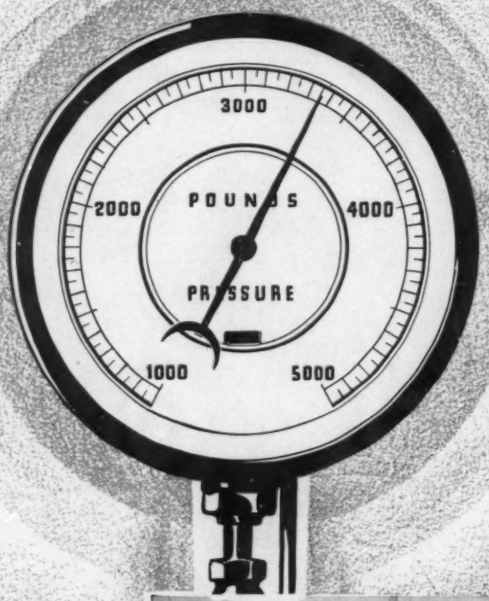
● This is not because of a magical formula. It is the natural result of experience, adequate facilities, and care.

● These have combined to develop a pronounced consumer acceptance of Robertshaw controlled gas ranges. Today more than 2,000,000 women use it daily in their oven cookery. The vocal praise of satisfied users has been strengthened by fifteen years of sustained advertising. In 1935 Robertshaw will continue to sponsor modern gas cookery by means of magazine advertising reaching three million able-to-buy families, and cooking schools attended by more than three million women.

● Development implies moving onward. The Model XC Robertshaw offered this year has features found in no other control. Beautiful in appearance, easily and economically installed, it combines the control and the oven valve in a mechanically sound arrangement. Needless to say, in common with all prior Robertshaw models, it has been thoroughly tested and is offered to the trade with the assurance we place on all products that bear our name.

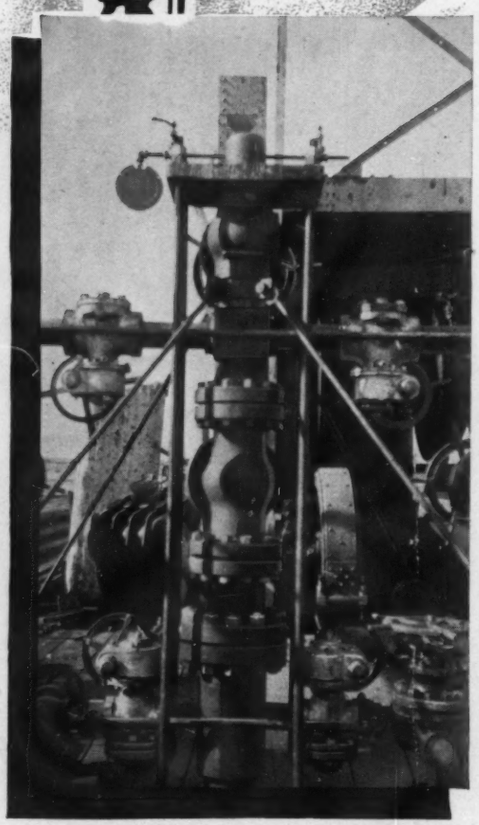
ROBERTSHAW THERMOSTAT COMPANY—YOUNGWOOD, PA.

# NORDSTROM VALVES *hold* TERRIFIC PRESSURE *at Belridge*




## 40,000,000 FEET OF GAS

On a recently completed deep sand well in the North Belridge field (Calif.) the highest working pressure ever encountered in the U. S. is held securely by four Nordstrom Plug Valves. They operate freely at this differential, handling 36 gravity crude at the terrific working pressure of 3,350 lbs. This is a 9,000-barrel well, delivering 40,000,000 feet of gas. The engineers took no chances. They installed Nordstroms on the Christmas tree to assure positive control of this record-breaking pressure and ease of operation. Guard your gas lines with Nordstroms.



**3350 POUNDS WORKING PRESSURE**

•

**9000 BARREL PRODUCER**

•

**MERCO NORDSTROM VALVE COMPANY**

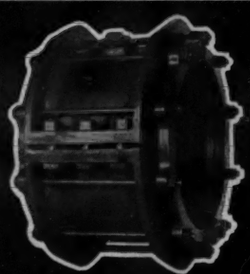
*A Subsidiary of*

**PITTSBURGH EQUITABLE METER CO.**

*Main Offices:* Pittsburgh, Penna. *Branch Offices:* New York, Philadelphia, Columbia, Chicago, Kansas City, Memphis, Tulsa, Houston, Los Angeles, Oakland

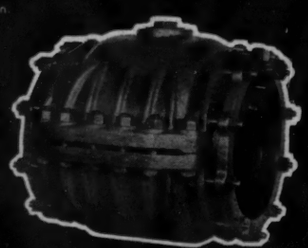
# FOR *QUICK* REPAIRS
## USE THESE SPLIT SLEEVES

When steel pipe or steel pipe joints break or leak, repair them quickly and *permanently* with a Dresser Split Sleeve and save time, trouble, and money. Such repairs can be made by ordinary labor—in most cases without interruption of the service. For emergency repairs, a Dresser Sleeve or two in stock may save hundreds of dollars. There's a Dresser Repair Sleeve for almost every type of leak. When ordering, specify outside diameter of pipe, operating line pressure, and kind of repair to be made. Rush orders are given special attention.



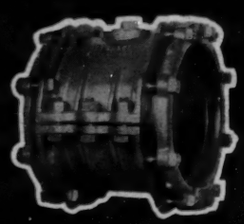
**STYLE 52-A**

This Split Sleeve will completely enclose and permanently repair *plain circumferential welds, screw collars, welded bell and spigot joints* and *double bell welded joints*. It will also cover splits or holes in the pipe up to 8" in length. Style 52-A is recommended for working pressures up to 500 lbs. per sq. in. and is available in all the standard steel pipe sizes from 4" I.D. to 26" O.D. inclusive. Write for further information.



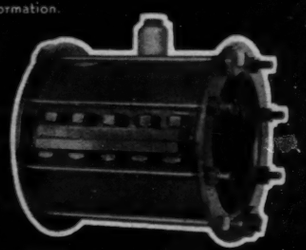
**STYLE 54-A**

The style 54-A has sufficient inside clearance to completely enclose and permanently repair *leaking joints of the bolted coupling type*. It is recommended for working pressures up to 500 lbs. per sq. in. Sleeves of this style are available in all standard steel pipe sizes from 2" I.D. to 26" O.D. inclusive. Write for further information.



**STYLE 73**

The purpose of this light, inexpensive Split Sleeve is to enclose and permanently repair *plain circumferential welded joints* and *screw collars*, as well as splits or holes in the pipe up to 8" in length. Two or more of these Sleeves can be joined together for larger breaks. Style 73 is recommended for working pressures up to 230 lbs. per sq. in. and is available in standard steel pipe sizes from 2" I.D. to 12" I.D. inclusive. Write for further information.



**STYLES 12, 13, 50, 380 and 400**

Above is illustrated a typical Dresser welded steel split sleeve of a type that is furnished when a *special pipe size* or *unusual enclosure* does not permit using Styles 52-A, 73, or 54-A. Welded steel split sleeves are built to order to meet the particular requirements of the repair. Detailed information should be furnished when ordering.

All illustrations made from actual unretouched photographs.

*A Dresser Sleeve On Hand Today May Save You Hundreds of Dollars Tomorrow*

S.R. DRESSER MFG. COMPANY

Bradford, Pa.

*In Canada:* Dresser Mfg. Co., Ltd., 32 Front St., W., Toronto, Ontario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# WESTERN GAS


"Reg. U. S. Pat. Off."

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MEMBER PERIODICAL PUBLISHERS INSTITUTE

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JAY JENKINS, Publisher, GEORGE H. FINLEY, Editor, CRAIG ESPY, Mid-Western Manager
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# LONG LIFE PIPE

## with gas-tight mechanical joints

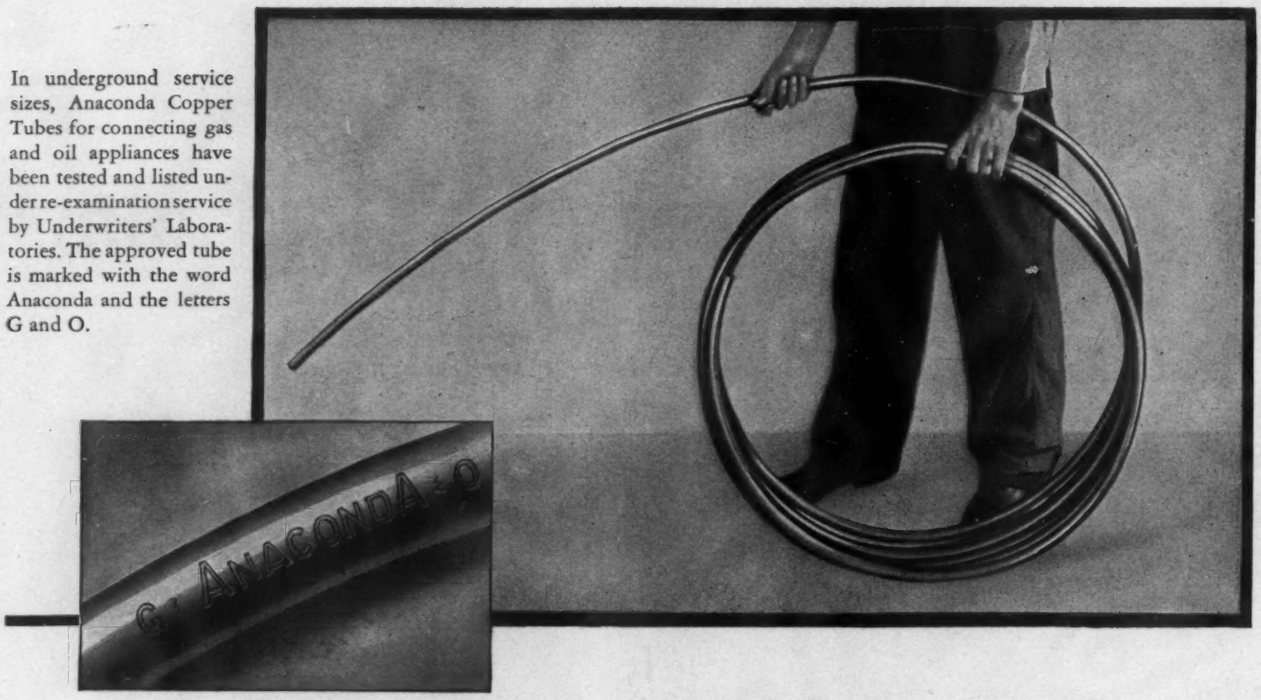
**The longevity of cast iron plus a bottle-tight mechanical joint that is simplicity itself to install. A ratchet-wrench the only tool. These are features of cast iron pipe with the stuffing-box type mechanical joint as made by members of The Cast Iron Pipe Research Association. The design varies but the basic principle is the same with all and all are bottle-tight as demonstrated in service.**

**The Cast Iron Pipe Research Ass'n, Thos. F. Wolfe, Research Engineer, 309 Peoples Gas Bldg., Chicago, Ill.**

# CAST IRON PIPE

METHODS OF EVALUATING BIDS NOW IN USE BY ENGINEERS RATE THE USEFUL LIFE OF CAST IRON PIPE AT 100 YEARS

In underground service sizes, Anaconda Copper Tubes for connecting gas and oil appliances have been tested and listed under re-examination service by Underwriters' Laboratories. The approved tube is marked with the word Anaconda and the letters G and O.




# Copper Tubes for small Mains and Services

## "... one way in which the gas industry may make *enormous savings* ..."

*—Quoted from "Gas Age Record"—Jan. 19, 1935*

FOR five years a well-known utility has been experimenting with copper tubes for gas services. And they report success beyond their "fondest expectations."

This investigation disclosed that original installation costs for labor and paving are the same, whether the services are of Copper or of rustable metal; that although the original material cost of Copper is higher, its far superior durability makes the *average annual cost* for material and maintenance very much less than that experienced with rustable lines. Little wonder that Copper tubes and "threadless" fittings are finding greater use for small mains and services!

For use with Anaconda Deoxidized Copper Tubes in underground service, The American Brass Company offers a full line of wrought copper "solder" fittings, as well as cast bronze fittings —both "solder" and "flared tube" types. All are supplied in elbows, tees, unions, couplings and adapter fittings. Relatively inexpensive, and light in weight, these fittings are precision-made to assure tight connections and an unrestricted flow. They are stocked by leading distributors of Anaconda Copper Tubes which, for underground use, are recommended in the Type "K" wall thicknesses shown in table at left.

In these products for the gas industry ...as in all others that bear the Anaconda trademark... every precaution is taken to assure uniform, dependable quality.

**Sizes and weights of Anaconda Copper Tubes—Type K**

| *Nominal Size* | *O. D. In.* | *I. D. In.* | *Wall In.* | *Lbs. Per Ft.* |
|---|---|---|---|---|
| ⅜" | .500 | .402 | .049 | .269 |
| ½" | .625 | .527 | .049 | .344 |
| ¾" | .875 | .745 | .065 | .641 |
| 1" | 1.125 | .995 | .065 | .839 |
| 1¼" | 1.375 | 1.245 | .065 | 1.04 |
| 1½" | 1.625 | 1.481 | .072 | 1.36 |
| 2" | 2.125 | 1.959 | .083 | 2.06 |

ANACONDA from mine to consumer

THE AMERICAN BRASS COMPANY

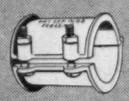
General Offices: Waterbury, Connecticut

*Offices and Agencies in Principal Cities*

NRA CODE

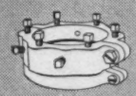
# ANACONDA COPPER & BRASS

SKINNER

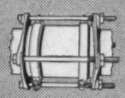


EMERGENCY PIPE CLAMP

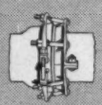
PIPE LINE CLAMP



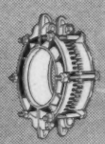
PIPE JOINT CLAMP



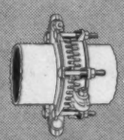
COLLAR LEAK CLAMP



BELL JOINT CLAMP



SPLIT COUPLING CLAMP



HIGH PRESSURE WELD CLAMP

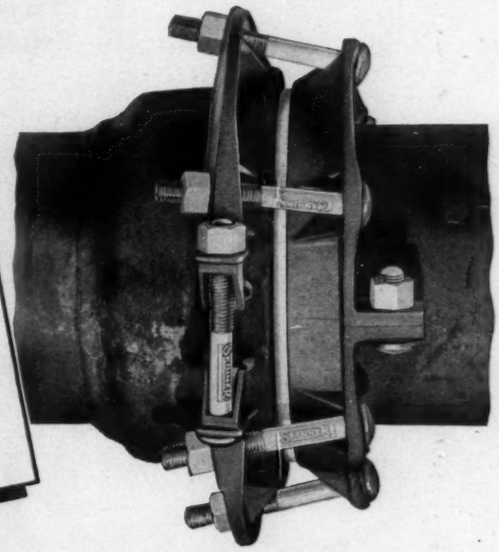
SERVICE SADDLE

PRESSED STEEL ECONOMY CLAMP

**A CLAMP FOR EVERY LEAK**

A SATISFACTORY BELL JOINT CLAMP MUST HAVE:

*a sealed gasket . . . complete adjustability to both spigot and bell . . . a large soft rubber gasket . . . ¾″ steel bolts, cadmium plated.*



# SKINNER BELL JOINT CLAMP

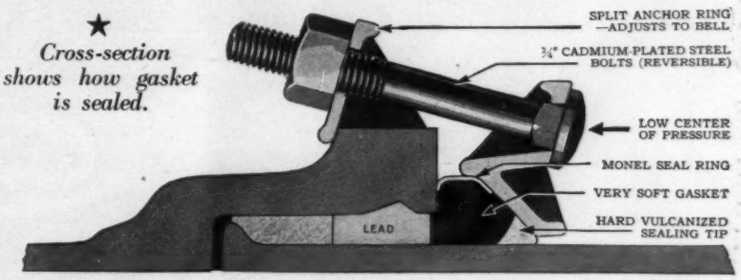
## is the only clamp that fulfills these conditions!

THE gasket in the Skinner Bell Joint Clamp is completely SEALED (1) at the bell face by a Monel metal band, (2) at the pipe by a hard vulcanized tip acting as a plug. (See cross section below.) Thus the gasket is REALLY sealed from air, sealed from water, sealed from bad soil conditions, sealed so that the gasket does not ooze out under vibration or line distortion. We repeat, only the SKINNER offers this feature. Remember this — no rubber compound is immune to solvents, but SEALED rubber excludes them.

The complete self-adjustability for variation in outside diameter of pipe, in our clamp, saves you money. For it cuts down the number of clamps you have to carry in your store-room. It is no longer necessary to carry two or three 6″ clamps, say, to fit that many variations in 6″ pipe size. Skinner 6″ Bell Joint Clamps fit all 6″ pipe regardless of age or class.

When you add to these two features the fact that we use an exceptionally large soft rubber gasket, and equip the clamp with ¾″ cadmium plated steel bolts, you can easily see why our sales are increasing so tremendously each year. Write for prices.

★ *Cross-section shows how gasket is sealed.*




*Write for new 1935 catalogue of the complete Skinner line*

**M. B. SKINNER COMPANY**

*Manufacturers and Engineers • Est. 1898*

**SOUTH BEND • • INDIANA**

# Linde Process Service

## *speeds-up* laying of

## *Sea-going Pipe Line*

UPON completion of an oil pipe line to load tankers a half mile out to sea, the Chief Engineer of the oil company was so pleased with the aid rendered by Linde Process Service that he wrote:

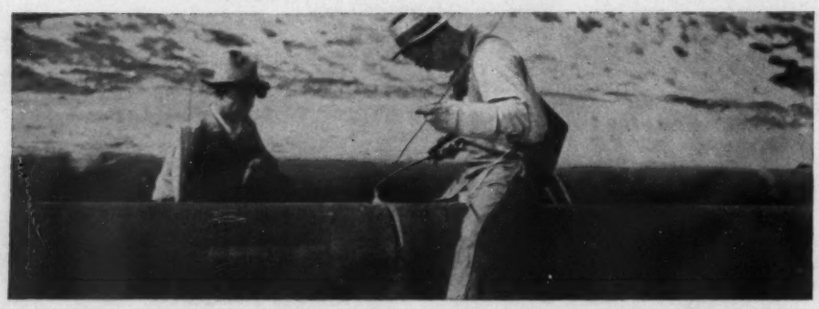
"We have recently constructed and successfully launched a 16-in. Submarine Line. The perfect consumation of this job was in no small measure due to the extraordinary efforts of your service organization. We are deeply appreciative of the splendid cooperation accorded us by your company."

This is Linde Process Service at work. It brings to Linde customers —at no extra cost—the latest and best pipe-line welding methods, assists in training and qualifying operators, and helps organize welding operations to insure satisfactory performance.

The nearest Linde Sales Office will gladly give you full information on Linde Process Service. These are located at: Atlanta—Baltimore, Birmingham, Boston, Buffalo, Butte —Chicago, Cleveland—Dallas, Denver, Detroit—El Paso—Houston—Indianapolis—Kansas City—Los Angeles—Memphis, Milwaukee, Minneapolis—New Orleans, New York—Philadelphia, Phoenix, Pittsburgh, Portland, Ore.—St. Louis, Salt Lake City, San Francisco, Seattle, Spokane and Tulsa.

Everything for oxy-acetylene welding and cutting—including Linde Oxygen, Prest-O-Lite Acetylene, Union Carbide and Oxweld Apparatus and Supplies—is available from Linde through producing plants and warehouse stocks in all industrial centers.

● OUT TO SEA—for a half mile this 16-in. Oxwelded pipe line rests on ocean bottom . . . supplies tanker cargoes.



● FIVE DAYS—from delivery of pipe to finished job. Linde Process Service cooperated. Oxwelding assured strong, permanent, leakproof, jointless line.

PRODUCT OF A UNIT OF UCC UNION CARBIDE AND CARBON CORPORATION

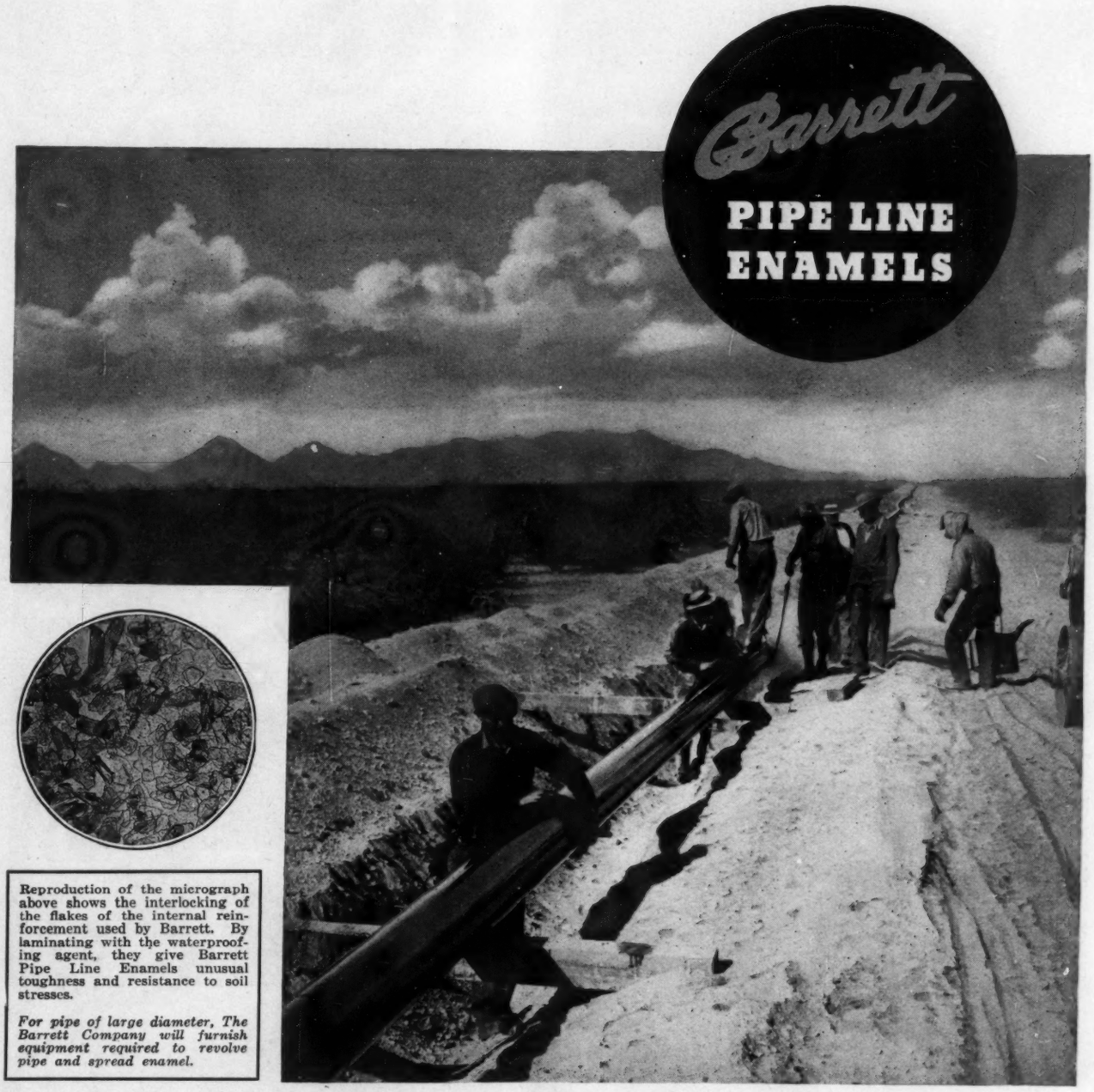
**The Linde Air Products Company**

*Unit of Union Carbide and Carbon Corporation*

UCC NRA CODE

In Canada:
Dominion Oxygen Co., Ltd. Toronto

YOU CAN ORDER EVERYTHING FOR OXWELDING AND CUTTING FROM LINDE






Reproduction of the micrograph above shows the interlocking of the flakes of the internal reinforcement used by Barrett. By laminating with the waterproofing agent, they give Barrett Pipe Line Enamels unusual toughness and resistance to soil stresses.

*For pipe of large diameter, The Barrett Company will furnish equipment required to revolve pipe and spread enamel.*

# Laminated structure gives unique strength and toughness to resist soil stresses

**Interlocking flakes of a special non-porous dielectric reinforcement give Barrett Pipe Line Enamels a laminated structure which increases normal strength and resistance to soil stresses. Besides adding resistance to pressure deformation, this unique Barrett flake-type filler supplies greater toughness and flexibility to the coating, and reduces slide and sag in application and service. And because a smaller amount of the filler is required than when the customary ground fillers are used, the proportion of water-resistant coal-tar pitch in Barrett Pipe Line Enamels is proportionally increased. For complete information on protective coatings to match right of way conditions, phone, write or wire.**

THE BARRETT COMPANY, 40 RECTOR STREET, NEW YORK, N.Y.

# • FOR YOUR METER DOLLAR

**Metering costs are being scrutinized as never before by progressive gas company executives. The whole metering situation is being weighed in terms of the greatest possible return on every meter dollar invested. • Traditional practice is being checked against the fact-finding results of reliable meter records. • In every such case, the advanced meter design and the improved materials and construction of modern meters will prove a protection against the higher, continuing upkeep cost of outmoded types.**

**. . . also RELIANCE REGULATORS for close pressure control and positive lock-up.**

**AMERICAN METER COMPANY**
INCORPORATED
*Measurement and control of Gas, Oil, Steam, Air and Liquids*
ESTABLISHED 1836

Meter Trade Names:
AMERICAN—D. McDONALD—METRIC—MARYLAND—PACIFIC—TUFTS

Albany Baltimore Birmingham Boston Chicago Dallas Denver Erie Kansas City
Los Angeles Philadelphia Pittsburgh New York San Francisco Tulsa

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February, 1935

# WESTERN GAS

Vol. XI, No. 2

"Reg.U. S. Pat. Off."

**A Monthly Journal of the Gas and Gas Appliance Industries in *Western America***

## It Depends on What You're Selling

WE'RE used to hearing from the electric fraternity that gas is dirty, and malodorous. Now comes welcome word from the same source that gas heat is clean heat, supplied without smell, smoke or noise. A first line manufacturer of electrical products—now making a gas appliance item—says so, and says it in black and white.

The bulletin we are quoting, prepared in support of the recently introduced gas equipment, is entitled "Gas—An Ideal Friend." It draws its arguments from the known efficiency and satisfaction of the gas range, in such phrases as these: ". . . simple as boiling a kettle of water on your gas range"—"This is clean heat if there ever was clean heat"—"Nobody's nerves ever went bad listening to the noise of a gas range—that is quiet heat."—". . . it burns . . . completely, without soot, or smoke or odor and it burns quietly; as the saying goes 'It has everything'."

All of which is news indeed!

## Changing Service Standards

CIRCULAR C-405, released late last month by the National Bureau of Standards, makes constructive recommendations which are in the direction of giving gas companies more freedom in conduct of their operations, while continuing to protect consumers' interests adequately. Important changes in earlier recommendations are made with respect to heating value, meter testing, and pressure control. In the circular the Bureau recommends that gas companies be left free to choose or change their own "standards" of heating value, and that meter testing which does not justify its cost be eliminated. In these and other respects the new Bureau of Standards recommendations are extremely important, and all companies will wish to secure copies of Circular C-405 at once. On another page a more complete report on the circular is offered.

Also of current interest in reference to service standards is the general order of the Wisconsin Public Service Commission which took effect on January 1. This order requires periodic inspection by utilities of customers' gas appliances (at least every 5 years), stipulates that specific gravity of gas served shall not vary more than 10 per cent from established standards, and sets up general regulations permitting billing for gas service on a heating value rather than a cubic foot basis.

## Natural Gas Safety Evidence

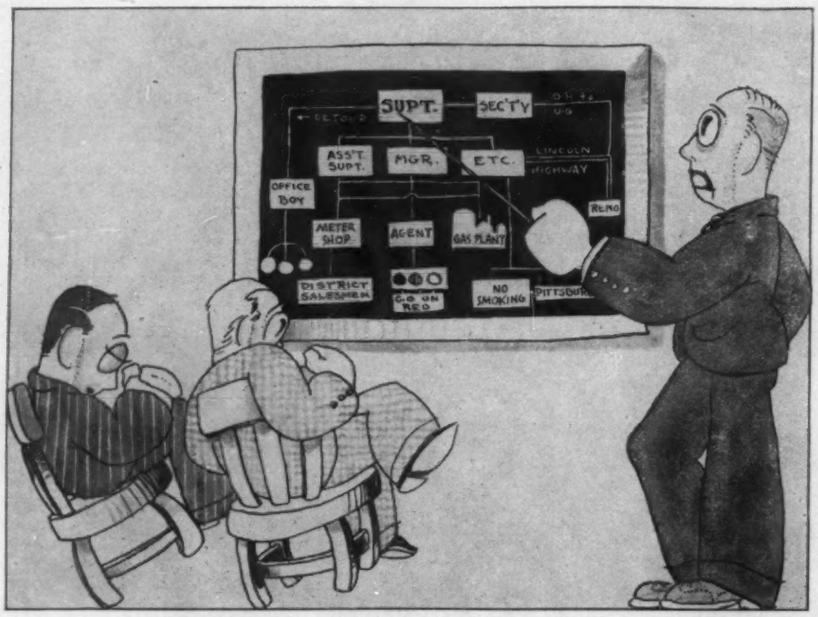
AN EXPERIMENT conducted at the Los Angeles Gas and Electric Corp. gas works on January 19 offers proof that natural gas is non-toxic, and offers it in terms that a layman can understand without taking graduate work in gas engineering. The room selected for the experiment was sealed and gas allowed to flow into it at a rate of 350 cubic feet an hour. When the gas concentration reached 25 per cent five men entered the room and remained for one hour and 15 minutes, during which time the concentration rose to nearly 30 per cent. Each of the five was quite comfortable during the whole test and suffered no disagreeable after-effects. The only sensation noted was a mild feeling of intoxication. It is pertinent to note that the natural gas used was odorized.

Everyone connected with gas service should know that breathing unburned natural gas is harmless, as demonstrated under the above extreme conditions.

## Federal Power Stand in Question

INTERVIEWED on power policies, at his January 23 press conference, President Roosevelt said the time is not ripe for new TVA's in other major river basins. He added, however, that regional advisory power committees may be appointed in various areas this summer, to help develop a future power program. Any one of a variety of interpretations may be placed upon the President's qualified statement. It is the break in the clouds for the utilities, or, it portends the extension of the TVA idea—all depending upon the viewpoint.

Meanwhile the holding company continues to simmer on the Federal hotplate, with various proposals brewing for special policing, licensing, and taxing of capital "write-ups". Perhaps Washington deems it politically expedient to brand the holding company as the industry's bad boy, and give over further efforts to apply the rubber yardstick of competition to operating companies.




• **Customers know little and care less about the intricate details of our business. It is easier to please than to educate them.**

# C R C

By H. T. EAST

Assistant to Vice-President, Public Service Company of Northern Illinois (Chairman, Customer Relations Committee, American Gas Association)

THE generous approval given the Federal administration at the last election may be construed as an indication that alphabetical groups, codes and authorities are in public favor. Although the gas industry may have no reason to become enthusiastic over these measures their widespread acceptance suggests the thought that we are remiss in not proceeding along similar lines. Even the skeptic will agree that if the gas industry is to join the alphabetical parade we must act quickly if we hope to obtain a letter designation not already chosen.

Recent experiences of business with codes are such as to make gas company officials shy at invitations to adopt anything with such a label. However, in addition to codes which we do not need, do not want, cannot afford and will not accept there may be codes which we do need, can afford and must accept if we are to enjoy satisfactory customer relations. Such a "code" is the subject of our writing.

The Customer Relations Code (CRC) which we propose for adoption by all gas companies genuinely interested in public opinion contains no revolutionary doctrines nor departures from sound practice. It can be followed without greatly adding to operating expenses. Instead of containing new provisions it is largely made up of ideas well-known to and once tried but now unhappily forgotten or neglected by many gas companies. The purpose of our CRC is to serve as a guide in all the many things which affect the various sorts and kinds of human personalities included among our customers. Close adherence to its regulations and admonitions will surely aid in improving service and in regaining the esteem of our patrons.

Long before the economic upheaval brought on rate agitations and other woes which led to loss of public goodwill, the gas industry realized the value of good service, fair dealing and friendly public relations. Refinements in service and liberal policies were adopted by many companies which later found it necessary to curtail or drop them entirely due to economic pressure. Some operating companies even partially ceased doing those things which cost little or nothing when they were no longer able to continue practices which were costly.

What is needed is a charted course, something which will require that every change in policy be weighed against the customer reaction it may cause before its adoption. A plan of systematically checking routines, policies and practices now in effect to determine whether they may be altered so as to better satisfy customers without appreciably reducing their effectiveness from a departmental standpoint is also needed. A code of customer relations which constantly keeps the importance of customer approval before those who direct operations should, if adopted, greatly aid in bettering customer relations at a time it is needed most.

## OUR CODE

*To the end that the service rendered our valued customers be made more satisfactory, more complete and more friendly the "City" Gas Company, its officers and employees pledge themselves:*

SECTION 1. To remember always that our company function is primarily to render service to the public, not merely to produce and distribute gas. We sell service—not gas.

*H. T. East*

SECTION 2. To develop the thought that we are working for the customers we contact and not just our company. In that manner we will come to give each patron proper consideration. To understand that there would be no company, no jobs for us and no gas business were it not for our customers.

SECTION 3. To realize that our particular job, whatever its nature, is part of a systematic plan to render service to the company's patrons and that the service which our customers receive will be better or worse to some degree, depending upon the attitude, spirit and efficiency we individually and collectively display.

SECTION 4. To keep in mind that the service we render is competitive. There are substitutes for it. Electricity as well as liquid and solid fuels are in open competition and tomorrow's developments may bring even stronger competition. The pleas of competitors will appeal less strongly to satisfied and friendly customers.

SECTION 5. To carefully analyze practices, procedures and policies with which we are concerned and strive to make them simpler, more effective and more acceptable from the customer's point of view.

SECTION 6. To know our rates and why they cannot be lowered. To recognize that although rates are dictated by factors which may make immediate reductions impossible, rate schedules which are simple and understandable are more acceptable to the rate payer.

SECTION 7. To diligently and systematically study our job and our responsibilities

in an effort to detect and eliminate those things which may irritate or displease customers.

SECTION 8. To report all complaints, questions and inquiries which come to our attention to the proper department of the company, thus giving our company opportunity to correct errors, explain away misunderstanding and make new friends.

SECTION 9. To admit mistakes when we make them. All humans err, and attempts to excuse or justify our errors do not create trust or esteem.

SECTION 10. To avoid citing company rules as excuses for doing what a customer wants done. A rule is not a reason. Any justifiable rule has a reason behind it; explain the reason instead of quoting the rule.

SECTION 11. To freely recommend to our patrons measures which will enable them to obtain economical gas service. This is a duty as well as an opportunity to render service.

SECTION 12. To always be tolerant of the customer's viewpoint. Their attitude is usually due to a lack of knowledge of our business. Never tell customers they are wrong, but lead them to see it. Keep an open mind.

SECTION 13. To never jump at conclusions concerning a complaint but to thoroughly investigate each one and dispose of it on the basis of the facts revealed. Settle complaints by actions, not by argument.

SECTION 14. To not only avoid discourtesy but also carefully avoid lack of courtesy. Our courtesy must be genuine, kindly and sincere.

SECTION 15. To be a good citizen. To take an active interest in civic affairs and faithfully discharge our duties as citizens.

SECTION 16. To be proud of our company and do our part to make it a company to be proud of.

# *a Customer Relations Code for the Gas Industry*

## AMPLIFICATION

Having adopted the code the next logical step is to study its provisions and become thoroughly familiar with the possibilities it opens up. A separate article could be written on practically any section of the code but for our purpose it will be sufficient to amplify each separate section briefly and offer suggestions concerning its possibilities:

(1) The average gas customer is little interested in the properties of gas, its measurement, distribution or the operation of our property. From his point of view the monthly bill is in payment for food cooked, space warmed or water heated. Once the gas company and its personnel come to realize that they are selling service and not gas, their attitude will assure better service.

(2) The attitude of individual employees toward their job is the principal factor determining the quality of service rendered. Employees whose sole interest in their job is their pay cannot contribute much to service. Employees who display a genuine interest in each individual customer they deal with and believe that their success lies in efficiently serving and satisfying the customers whom they contact are of real value.

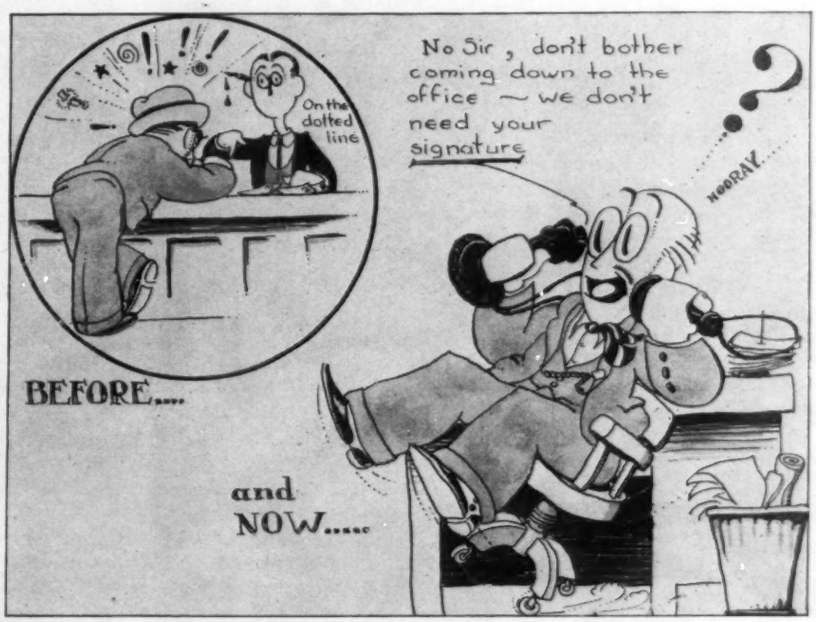
(3) Service is the cumulative result of the efforts of each and every individual on the payroll. Every employee, from the president down to the newest office boy, contributes something to it. A clear understanding of this fact will dignify the task and develop a better employee attitude.

(4) Although the "public be damned" attitude has practically disappeared from the gas industry, many utility customers still contend that our attitude would be different if our business were not monopolistic. A gas company, monopoly in name if not in fact, should always conduct its affairs as though it were keenly competing for the business of each customer it serves.

(5) In business as in our personal existence we are largely creatures of habit. Too often we continue doing a thing simply because we have always done it that way. It is a good plan to stand back occasionally and critically scrutinize our policies and routines. If this is done with an open mind many surprising opportunities for betterment may be revealed. In considering policies it is well to remember that a policy which saves dimes may cost good-will worth many dollars. Liberal, considerate policies which help avoid customer antagonism have a value which often outweigh the savings made by more stringent procedures.

(6) It has often been said that from a customer relations viewpoint it is regrettable that we are forced to charge for our service. Many agencies are at work influencing the public to believe that rates are exorbitant. The matter of rates and rate structures usually rests in the hands of the company's officers, but every employee can and should understand the fundamentals of rate making so as to be able to help allay suspicion by explaining rates when occasion demands.

*(Continued on Page 50)*




• The requirement that service applications be signed is typical of old fashioned practices which can be abandoned to customer's benefit.

● AT RIGHT: Chairmen of the regional sales councils responsible for the forthcoming sales conferences at Chicago, Dallas and Pittsburgh.

W. L. JONES
MID-WEST

W. A. HUDSON
SO.-SO.-WEST

W. L. HUTCHESON
EASTERN

● CONFERENCE DATES:
Chicago: February 14, 15, 16.
Dallas: February 20, 21, 22.
Pittsburgh: February 28, March 1.

# A Month *of* Sales Conferences

W. W. WINTER
President
So. Gas Ass'n.

S. L. DRUMM
Sec.-Treasurer
So. Gas Ass'n.

FEBRUARY is Regional Sales Conference month in the gas industry, with three important meetings due which will bring together a majority of the sales executives of the country. Coming in the early stages of the year these conferences, set up annually by the Commercial Section of the American Gas Association, are a powerful influence for effective selling all through the year.

Each of the conferences is set up by a separate sales council made up of leading sales officials of companies within the area included by the conference.

Southern Gas Association, of which W. W. Winter, Atlanta, Georgia, is president, and S. L. Drumm, New Orleans, La., secretary-treasurer, is lending unusual importance to the Southwestern Regional Sales Conference by holding its meeting during the same dates. Details of these sessions are given at a later point.

## CHICAGO CONFERENCE

Set for February 14, 15 and 16, the Mid-West Regional Gas Sales Conference at Hotel Sherman, Chicago, leads the list, with W. L. Jones of St. Louis County Gas Co., Webster Groves, Mo., in charge as chairman and A. E. Schwarz, Minnesota Northern Power Co., Minneapolis, Minn., vice-chairman. The following subject heads indicate the range of discussions provided for the Chicago group.

*February 14 and 15*

Merchandising
The National Range Sales Contest
The Heart of the Home—*A Sound Film*
Gas Refrigeration During 1935
What the Better Housing Program Means to the Gas Company
Cooking for Profit
The Prospect for Gas Water Heating
Developments in Rental-Sales Plans
The Market for Upstairs Controls
What About Flood Lighting
Planning a House Heating Program—A *Skit*
House Heating—via the Telephone—*A Skit*

*Home Service Session, February 16*

Home service will occupy a half-day session at the Mid-West Conference, Saturday morning, February 16, under the supervision of the A.G.A. Home Service Committee, with Margaret Nevins, chairman, in charge. A home service luncheon will follow this meeting. The home service topics for discussion are these:

Home Service and Sales
Home Service and Home Modernization
Home Service in Trade-Dealer Contacts
Home Service Activities Throughout the Gas Industry
Symposium of three-minute talks on Home Service Work by Mid-Western Home Service Directors

## DALLAS CONFERENCE

As mentioned above, the February 20, 21 and 22 meeting at Dallas, Texas, is a joint affair—the first meeting of the affiliated groups of the Southern Gas Association and the Southwestern Regional Gas Sales Conference. W. A. Hudson of the Birmingham Gas Co., is chairman of the council in charge of the Dallas sales conference sessions.

W. C. GRANT

C. K. PATTON

In Charge of Arrangements for Dallas Sales Conference and Southern Gas Ass'n. Meetings

In addition to the sales conference programs there will be general sessions, a technical section meeting, and a round table discussion (scheduled for Wednesday at 3 p.m.) for those interested in industrial gas subjects.

General session subjects thus far arranged include the following:

The Gas Appliance Institute
Systematic Servicing of All Gas Appliances
T. V. A. Policies as They Affect the Gas Industry
What is Offered to the Southern Gas Industry at Present in Air Conditioning

For the Sales Conference the following are the selected discussion topics:

Suggestions for Selling Gas Flood Lighting
Developing Commercial Baking Business
Developing Heavy Duty Commercial Cooking Business
Developing Commercial Cooking Through Across-the-Counter Merchandise
Rental Purchase Plan of Selling Automatic Water Heaters
Advertising That Sells
Gas Engines for Power
New and Reconnect Customer Campaign
Gas Rate Design with Respect to Heat-Hour Comparison with Electric Rates
Gas Refrigeration
How to Sell Vented House-Heating
Selling Radiant Type Heaters

*(Continued on Page 30)*

# Compression Ratio-Efficiency Relation *in a* Gas Engine

*By* GROVE LAWRENCE

*Southern California Gas Company**

THE gas engine load is very attractive under most conditions, and both the utility and the engine builder are interested in its development. Where competition takes the form of electric motors, the superior economy of the gas engine usually is established readily as an important sales argument. Over other forms of fuel, such as oil, the margin of economy may not be so great. Experience has shown that the fuel cost represents from 30 to 50 per cent, or more, of the total operating expense of a gas engine, so that any improvement which will reduce the fuel consumption should be of great help to the sales force in their load-building efforts.

The investigation covered by this report was made to determine what improvement in economy may be effected by increasing the compression ratio of a gas engine.

*Theory*

The operation of most 2- and 4-cycle gas engines is based upon the "Otto" cycle of events, which may be represented upon the Pressure-Volume plane as shown in Fig. 1. Starting at point $p_1$ in the diagram, the gas-air mixture is at pressure $p_1$ and corresponding temperature $T_1$. As the piston moves to the left, the mixture is compressed adiabatically to pressure $p_2$ and temperature $T_2$. Here ignition and complete combustion occur at constant volume, to $p_3$, whence follows adiabatic expansion (the working stroke) to $p_4$. The pressure reduction $p_4 - p_1$ at constant volume completes the cycle.

The expression for efficiency of this cycle is

$$E = 1 - \frac{T_1}{T_2}$$

It can be shown that

$$\frac{T_1}{T_2} = \left(\frac{P_1}{P_2}\right)^{(K-1)/K} = \frac{T_4}{T_3}$$

where "k" represents the ratio of specific heats of the working substance, and the other symbols represent conditions as shown in Fig. 1.

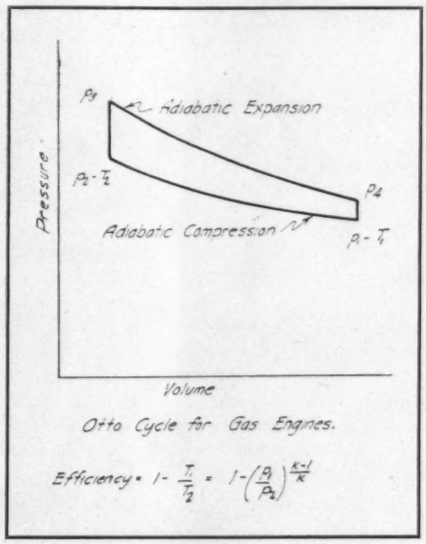



FIG. 1.

It may be expected, therefore, that in the practical case, all other conditions being equal,

(a) the efficiency will vary with the compression ratio $p_1/p_2$.

(b) it depends upon the nature of the fuel-air mixture $c_p/c_v = k$.

(c) 100% efficiency can only be had by reducing the initial pressure to absolute zero.

*Practice*

In actual operation, the first limitation encountered in the devlopment of maximum efficiency is that the initial pressure, $p_1$, cannot be reduced much below that of the atmosphere. With that value fixed, and the factor "k" being determined by the nature of the fuel mixture, the only variable remaining under the control of the operator is the compression ratio. Inspection of the expression for efficiency shows that the value of $p_2$ should be made as large as possible. This condition has been well recognized by the automotive industry, and is responsible for the development of "anti-knock" fuels.

Again, in practice, the maximum allowable compression pressure is limited by the resulting peak, or explosion pressure. This latter must not be allowed to exceed the value used in designing the bearings, frames, and other parts of the engine which are subjected to stress from the working stroke. Higher peak pressures also indicate greater temperature difference between the working substance and the water jacket, thus increasing the loss due to cooling water and radiation. Since radiation is a function of the fourth power of the absolute temperature, the loss from that source may build up rapidly. Finally, at higher temperatures, there is a tendency towards detonation and pre-ignition, which must be avoided.

The problem then resolves itself into the selection of the highest possible compression pressure without exceeding the peak pressure for which the machine was designed.

*Conditions and Equipment*

The unit on which these tests were made was an Ingersoll-Rand type XG direct-connected gas engine, operated as a single, rated at 100 hp. at 210 r.p.m. It was fitted with a special power cylinder made of wrought steel, but the standard valve-in-head cast iron cylinder head was used. The construction permitted the variation of the compression pressure between desired limits by using a longer piston rod and screwing it in or out of the crosshead.

Test runs were of 4- or 5-hour duration, and no adjustments were changed during a test period. Horsepower output was calculated from indicator cards, which were taken hourly. Calculations were made by slide rule throughout. Data are recorded in Tables No. 1 and No. 2, and shown graphically in Fig. 4.

*Procedure*

The first group of tests consisted of nine 4-hour runs, recorded in Table No. 1. In these, compression was maintained at pressures from 76 to 140 pounds per

*Contributed to the Technical Section, Pacific Coast Gas Association.

TABLE NO. 1.

| Run No. | Compression Ratio | Thermal Efficiency (Per Cent) | Peak Pressure Lbs. per Sq. In. | Indicated Horsepower | Fuel per I hp.-hour Cu.Ft. 60°–30 In. | Spark Advance Degrees | Exhaust Gas Analysis $CO_2$ | $O_2$ | CO |
|---|---|---|---|---|---|---|---|---|---|
| A-7 | 3.5 | 20.5 | 260 | 102 | 11.41 | 15 | 8.0 | 6.0 | 0.8 |
| A-9 | 3.5 | 24.2 | 220 | 99 | 9.61 | 20 | 7.5 | 7.9 | 0.0 |
| A-8 | 3.5 | 24.6 | 236 | 88 | 9.36 | 50 | 8.2 | 5.8 | 0.6 |
| A-6 | 5.5 | 24.1 | 276 | 101 | 9.59 | 18 | 8.0 | 7.0 | 0.0 |
| A-5 | 6.5 | 24.0 | 300 | 106 | 9.63 | 18 | 8.0 | 6.6 | 0.4 |
| A-4 | 6.5 | 25.7 | 268 | 105 | 8.98 | 18 | 7.7 | 8.1 | 0.0 |
| A-2 | 7.0 | 25.4 | 272 | 110 | 9.10 | 15 | 7.0 | 8.0 | 0.6 |
| A-3 | 7.0 | 25.7 | 312 | 99 | 8.95 | 20 | 7.6 | 7.6 | 0.2 |
| A-1 | 7.5 | 25.5 | 300 | 106 | 9.07 | 18 | 7.0 | 8.2 | 0.4 |

TABLE NO. 2.

| Run No. | Compression Ratio | Thermal Efficiency (Per Cent) | Peak Pressure Lbs. per Sq. In. | Indicated Horsepower | Fuel per I hp.-hour Cu.Ft. 60°–30 In. | Spark Advance Degrees | Exhaust Gas Analysis $CO_2$ | $O_2$ | CO |
|---|---|---|---|---|---|---|---|---|---|
| B-3 | 5.5 | 21.6 | 198 | 102 | 10.70 | 10 | 9.0 | 4.7 | .0 |
| B-4 | 5.5 | 23.1 | 220 | 102 | 10.00 | 20 | 8.2 | 6.1 | .0 |
| B-2 | 5.5 | 23.7 | 240 | 103 | 9.78 | 10 | 8.4 | 5.8 | 0.0 |
| B-1 | 5.5 | 23.8 | 244 | 102 | 9.66 | 10 | 8.0 | 6.7 | 0.3 |
| B-5 | 6.0 | 23.3 | 200 | 109 | 10.00 | 12 | .... | .... | .... |
| B-6 | 6.0 | 24.1 | 240 | 103 | 9.64 | 18 | .... | .... | .... |
| B-7 | 6.0 | 25.1 | 240 | 103 | 9.23 | 23 | 7.4 | 7.4 | .4 |
| B-8 | 6.0 | 25.7 | 280 | 106 | 8.97 | 29 | 7.4 | 6.6 | 1.0 |
| B-10 | 6.75 | 25.1 | 290 | 104 | 9.20 | 20 | 8.0 | 6.4 | .6 |
| B-11 | 6.75 | 25.2 | 232 | 109 | 9.20 | 16 | 8.0 | 6.1 | .3 |
| B-9 | 6.75 | 28.2 | 320 | 115 | 8.20 | 28 | 7.2 | 6.8 | 0.7 |
| B-15 | 7.2 | 25.5 | 272 | 109 | 9.08 | 20 | 7.9 | 7.0 | .1 |
| B-16 | 7.2 | 25.7 | 272 | 102 | 9.03 | 30 | 7.6 | 7.6 | .1 |
| B-17 | 7.2 | 26.6 | 300 | 107 | 8.71 | 30 | 8.4 | 6.0 | .0 |
| B-12 | 7.75 | 25.2 | 236 | 106 | 9.27 | 16 | 7.8 | 7.0 | .1 |
| B-14 | 7.75 | 26.8 | 304 | 109 | 8.63 | 28 | 7.2 | 7.8 | .1 |
| B-13 | 7.75 | 27.0 | 280 | 111 | 8.78 | 23 | 7.7 | 7.7 | .4 |

square inch. (As used herein, "compression pressure" refers to the gauge pressure to which the charge is compressed during actual operation.) Some runs were made with the compression held constant, in which cases the degree of spark advance was the variable.

At all compressions above 100 pounds per square inch, the mixture adjustment was found to be very critical, so it was difficult to maintain the desired gas-air ratio. The indicator cards had high, sharp peaks, and the expansion line followed a wavy path which is often associated with detonation. The exhaust gas analysis showed fairly good combustion with about 30 per cent excess air.

After studying the data from this set of tests, the representatives of the Ingersoll-Rand Co. suggested the use of a skirt or shroud on the inlet valve, which would serve to direct or partially control the turbulence of the gas-air mixture as it entered the combustion chamber. This device, illustrated in Fig. 2, consisted of a segment of 4-inch steel pipe, which was brazed on one side of the inlet valve, just inside its beveled face. The charge of gas and air can be directed toward any part of the combustion chamber by revolving the valve part way about the axis of its stem, and various conditions of turbulence are thereby obtained.

The relative position of this skirt with respect to the exhaust valve and spark plug is indicated on the sketch of the cylinder head, Fig. 3. The arrow indicates the direction in which the gas is deflected. This device was in use during all the runs recorded in Table No. 2.

*Discussion of Results*

The fuel consumption for the first set of tests (in which the inlet valve was *not* equipped with the special skirt) showed the expected decrease as the compression was raised. Very little CO was present in the exhaust gas during these runs. Because of the critical nature of the mixture adjustment, together with rough operation and "pounding," it was felt that continuous operation could not be maintained at the higher, more economical compression ratios.

At the start of the second series of tests, Table No. 2, the special skirt was installed on the inlet valve. Then, with the compression set at approximately 80 pounds per square inch, and with all other adjustments held constant, the position of the inlet valve skirt was varied as shown in the small sketches, Fig. 3. In each case, the arrow indicates the direction of the deflected gases, and the corresponding

*(Continued on Page 52)*

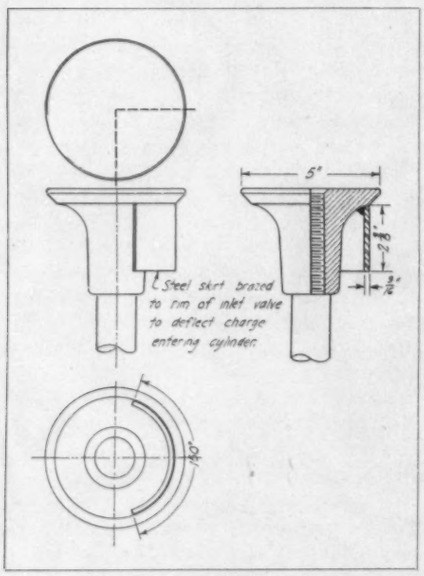



FIG. 2.

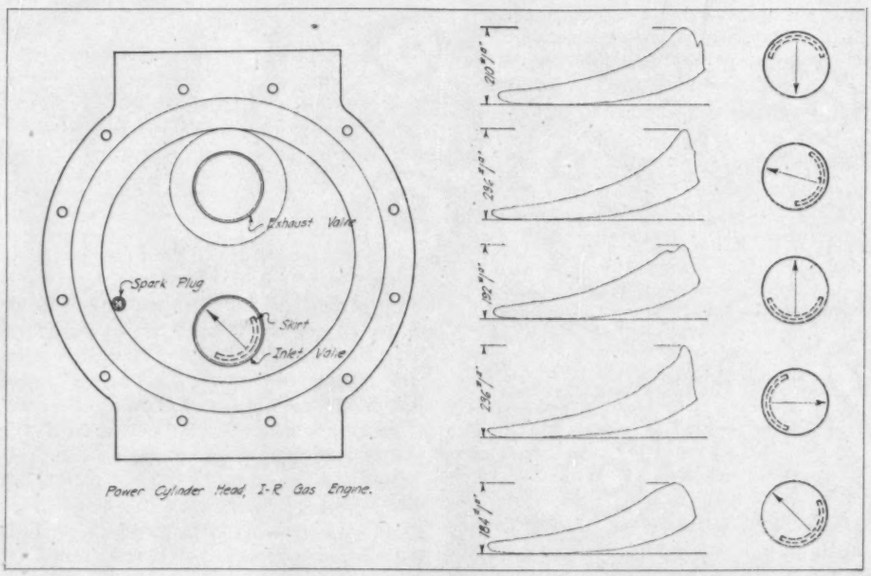
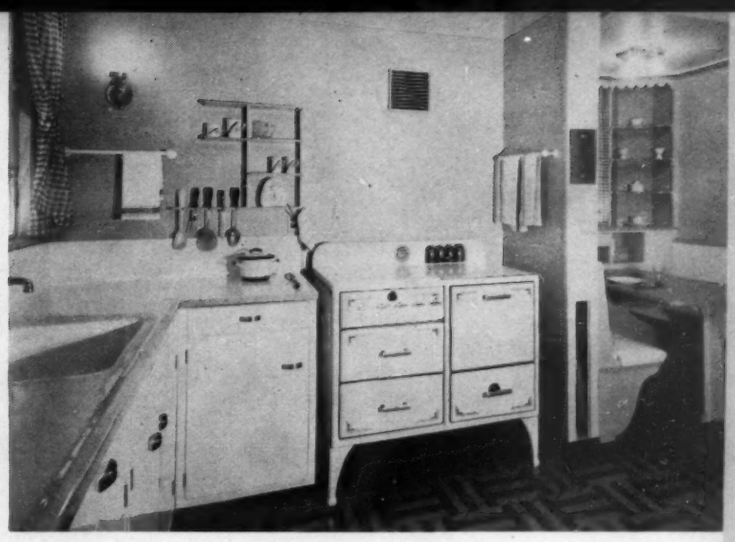



FIG. 3.



EFFICIENT, ATTRACTIVE MODEL KITCHEN . . . PART OF A COMPLETE PLANNING EXHIBIT AT PEOPLES GAS HEADQUARTERS

# KITCHEN PLANNING... *Timely*

*By* HARRY SWENSON

*Director, The Kitchen and Basement Planning Bureau, The Peoples Gas Light and Coke Company*

IS the operation of a Kitchen Planning Bureau a profitable venture for a utility company, or should it be classified as an altruistic activity of an educational nature? Since no utility company can these days afford to be engaged in an altruistic enterprise the answer must be and is that this new activity of many companies proves itself profitable.

*Harry Swenson*

While recent, it is no longer an untried activity. Many gas companies, including The Peoples Gas Light and Coke Co., have had this interesting department of service in operation long enough to judge of its value. Fitting hand in glove with the immense modernization campaign launched with the F.H.A. program, it has gained new importance and a larger field for action. The prevailing wave of modernization, housing projects and eventual new home building, gives this new service the impetus that should carry it along to satisfactory results. Whatever cooperation given this campaign is certain to be repaid.

The movement for home improvement is an actuality. In this connection it is well to realize that the loans arranged for under the F.H.A. are not a proper gauge for determining the amount of activity traceable to the advertising given the Better Housing Program. Modernization financed independently of the loans either by private cash on hand or by special arrangements with mercantile houses is reaching encouraging dimensions. But continuous, vigorous and well directed publicity is particularly needed at this point in order to gain the momentum required to show results in Spring.

It is of vital interest to gas companies and business houses that this Federal and civic publicity be augmented. Whether the Better Housing Movement is considered artificial respiration or not, no one needs to probe very deeply into existing conditions to know that an acute need for home modernization is there. It is doubtful if private building will commence in the near future on any important scale, but it is certain that the average American home will not indefinitely tolerate inadequate conditions. Mass-action is a national characteristic, and once under way the home rehabilitation movement will take on exciting dimensions. Everyone who has a yard of carpet, a pot of paint, a keg of nails or a gas range to sell should in self interest be eager to speed this modernization campaign.

Establishing a Kitchen Planning Office is an intelligent way of supporting the Administration in its efforts, serving the public and cooperating with manufacturers and merchants. No time has been more propitious for such cooperation than is the present. Gas companies should cease thinking of the kitchen in terms of a gas range, refrigerator or water heater, as independent of other units. Any or all of these appliances must be considered in relation to all other units and parts that go to make a room a kitchen. To know and coordinate these various units and parts for efficient function in the most attractive way is the purpose of the Kitchen Planning Bureau. To convey this knowledge and to demonstrate tenable theories it is almost necessary and certainly recommendable to establish a visual exhibit embracing practically all that is part and parcel of the kitchen. Successful merchandisers have long practiced the clever art of proper juxtaposition by locating related wares so that ensemble buying will result. In a way that is what Kitchen Planning aims to do. No article of dress and no item of furniture is ever bought without a mental or real picture of its relationship in form and color to other articles existing or to be purchased. Women have a keen sense of "ensemble" and it is folly to suppose that gas appliances enjoy exemption in their calculations.

With this view The Peoples Gas Light and Coke Co. decided to make a complete exhibit in connection with its Kitchen and Basement Planning Bureau. The exhibit includes not only appliances in natural environment, which meant the building of kitchens, but also a display of related units: sinks, cabinets, construction materials, floor and wall coverings, paints, curtain suggestions, photographs, drawings and actual building

plans. Constantly voiced approval by visitors proves the wisdom of associating the appliances with other units in suitable settings. With thousands of homes installing gas heat it was found that the original Kitchen Planning Service had to enlarge its scope to include advice and help to the many who wished to improve their basements as a result of their new found enjoyment. As a logical sequence came the need for giving information on insulating materials and their application. Public interest in simplified explanation of the loan procedure under the F.H.A. made it desirable that accessible offices be opened to serve this activity. It was natural that the Kitchen and Basement Planning Bureau should render this service. Also, with such a broad field the Bureau becomes an important and valuable factor for rational home planning.

With actual kitchens to demonstrate theories and with appliances and materials on hand it becomes a simple and agreeable matter for the Bureau advisor and client to recommend and select not only the main units but all the important accessories. Color schemes can be chosen and details decided under expert guidance, unhurried and unharrassed by eager sales clerks. The client can select and assemble the entire kitchen with sympathetic understanding, for not only the needs but also the habits and circumstances of the family are considered before recommendations are made; the result is a kitchen that fits and satisfies.

*Trade Cooperation*

Manufacturers of equipment and materials were eager to participate in the making of the exhibit—naturally so, for it represents a satisfactory and costless source of sales to them. Architects, contractors and merchants were equally eager to establish connection with us and to use the exhibit as a showroom for prospective customers, all of which fits in very well with the plan from our angle. It is important that the architect or contractor engaged in designing or building a kitchen render the room as efficient as possible, but neither the architect nor the contractor can be expected to know much of kitchen routine. Certainly he cannot be expected to know anything of the mysteries and rituals of cooking. Perhaps he knows where the towels should hang and where the percolator is handiest to the range, but on the whole he is on unsure ground. Yet accurate knowledge of these things is imperative in kitchen planning, and no professional prestige is sacrificed by consulting authorities on the subject. The Kitchen Planning Bureau should and can supply all needed information upon call; being in constant touch with manufacturers of kitchen equipment, reliable and informative data can be had without loss of time. The writer has had many indications that an informatory office to service the architect and builder is a welcome and appreciated service.

*Growing Attendance*

Undue elaboration was avoided in building the exhibit. With no suitable space available on the main floor a large room adjacent to the offices of the Bureau on the third floor is set aside for the display. That the exhibit is not on the main floor seems to be no handicap to attendance. Stimulated by regular announcements on the radio, periodical advertisements in newspapers, store and window displays, attendance is constant and growing. Let us see who were the new callers on a certain day in January and what was on their minds. Our records show that 48 persons for one reason or another consulted us on kitchen and basement problems. The log indicates that the reasons were:

Requests for plans for complete kitchen remodeling ..... 4—women, 2—men

Request for information on treating basement walls for painting..... 1—woman

Request for instructions to build basement partitions and floor treatment ..... 1—woman, 1—man

Request for drawings and description of certain parts of the exhibit ..... 1—man

For help in layout of more cabinet space ..... 1—man

Bride-to-be inspecting kitchens for suggestions ..... 1—woman

Requests for color schemes..... 6—women, 2—men

Information on F.H.A. loans..... 2—men

Information about flooring..... 1—woman, 1—man

Prospective builder inquiring about insulation and kitchen plans..... 1—man

Architect interested in kitchen layout ..... 1—man

Man and wife just "looking"

To see ranges and sinks..... 1—woman

Request for plans to build basement recreation room..... 2—men

Request for help in planning a hobby room in attic..... 1—man

To inspect exhibit with definite interest ..... 8—women, 4—men

"Just curious" ..... 3—women

Contractor to inspect kitchens on request of client.

Of these 48 new contacts made on that day it is reasonable to expect that in every one of the six kitchens about to be remodeled at least one new major gas appliance will be placed. The man dreaming of building a home in Spring can certainly be checked on our list as a likely prospect for every appliance, including gas heating equipment.

It is necessary, of course, to ask numerous pertinent questions which serve as basis for determining whether or not the client is a candidate for a new appliance. Questions addressed to our visitors as we talk of many things are never resented. There is a noticeable willingness and frankness to acquaint us with their particular problem and mode of living. The issue of selling is never pushed unduly, nor is any information on the prospect's needs given to dealers save with the consent of our caller.

By inquiry we have found that 9 out of 10 families enjoy eating one or more meals in the kitchen. Contrary to supposed view, most men take an interest in the kitchen; every third visitor at the Bureau is a man and his call refers just as often to the kitchen as to the basement. Naturally he is more concerned about construction materials and details of planning, but questions directed to us indicate a degree of familiarity with kitchen functions. Request for advice in color choice leads all applications, which proves the universal interest in color and also the general helplessness prevailing when decision is required in this matter.

*Worth the Cost*

The building of an exhibit, the operation of it, cost of attendants who must be competent in preparing plans and giving correct and helpful answers, the advertising necessary to make the enterprise a live issue—all call for an expenditure of money. There must be valid reasons for money outlay these days, so the question becomes: Is the Kitchen Planning Service a profitable activity? The answer is unreservedly, "Yes, Kitchen Planning does pay." The concentrated, well-directed stimuli exercised by the service are showing results in sales of gas appliances directly traceable to advice or plans made by the Bureau. Not to be underestimated is the pleasant relationship resulting from the gas company extending this agreeable hand of service to all its customers, to manufacturers and merchants. It approaches the ideal method of selling, while it epitomizes the company's aim to render cheerful service.

## Missouri Utility Reorganized

Central States Gas Utilities Co., Kansas City, Mo., subsidiary of the Panhandle Eastern Pipe Line Co., has been reorganized and will operate under the name of the Central Distributing Co. The company supplies towns in Kansas and Missouri with natural gas service.

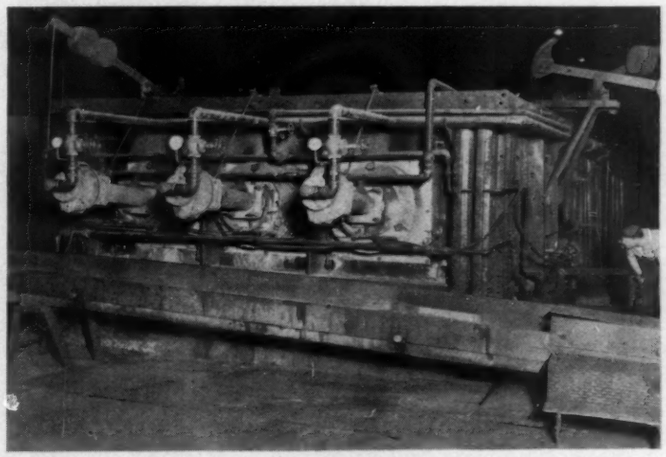
# The West's Largest Steel Mill

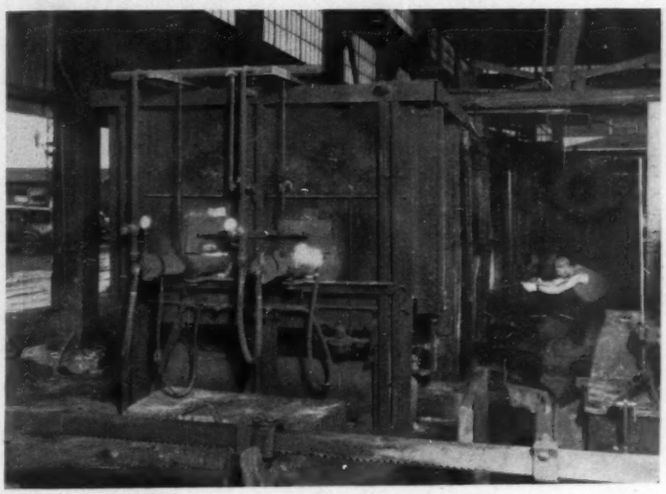
## ...NATURAL GAS USER

## *Utilization Equipment at the Columbia Steel Plant*

*By* K. B. ANDERSON

*Manager, Coast Industrial Gas Company*





UPPER: Gas-fired ingot-heating furnace in rolling mill, Columbia Steel Co. plant at Pittsburg, Calif. LOWER: Gas-fired billet-heating furnace in rolling mill at same plant.

THE period from 1931 has witnessed practically the complete conversion to natural gas fuel of the Pittsburg, Calif., mills of the Columbia Steel Co., subsidiary of the United States Steel Corp. The work has been executed by engineers of the Columbia Steel Co. and of the Coast Industrial Gas Co. As the largest steel mill west of the Mississippi, the conversion has been of considerable technical interest, due to the large capacities of the equipment involved.

*K. B. Anderson*

Consisting of open hearth furnaces, steel foundry, rolling mill, wire mill, wire nail mill, sheet mill and tin plate mill, the present Columbia production includes sheets of all kinds and grades, tin plate, wire of all kinds and grades, wire nails, castings, rolling mill products such as billets, merchant bars, bar shapes, coiled rods, tie plates, etc.

Natural gas fuel is supplied to the plant from a 10-inch line at 75 pounds pressure. Before entering the plant, it is passed through an orifice meter and regulator station, reducing the pressure to 21 pounds for plant use. This regulation at the supply source minimizes the need for individual regulators at points of use. The pilot and dead weight principle of regulation used provides fuel at a minimum pressure fluctuation. A complete loop of 6- and 12-inch lines supplies the plant. The entire distribution line is welded and so sectionalized that any portion may be isolated without affecting the rest of the mill. Each installation is provided with an individual meter, allowing proper interdepartmental fuel accounting.

Equipment converted to natural gas firing within the past two years includes the open hearths, and heating furnaces in the rolling mill, tin mill, sheet mill and foundry. (See illustrations.)

The four basic open hearth furnaces represent the first application of natural gas in this field on the Pacific Coast. Each furnace is fired with four open pipe gas burners, two at either end. A regenerative type of firing is secured by alternating the firing from one end of the furnace to the other as the preheated air is reversed in the regenerators below the furnace. The burners are alternated about every 8 minutes.

A complete recording and indicating instrument set-up is provided for each furnace, registering gas flow, temperatures and draft. Average temperatures maintained for this operation are 3100° F. brick temperature, 3500° flame temperature and 2900° steel temperature. The average firing period is eight hours which, with four furnaces operating, results in a finished heat about every second hour. Each furnace has a stack about 125 feet high and with a base diameter of 4 feet.

In the rolling mill, a continuous-operation billet heating furnace, 12 by 56 feet, with a maximum temperature of 2100° F., is fired with Surface Combustion gas burners. Two continuous ingot heating furnaces in this mill were also converted at the same time. These furnaces are 7 feet 6 inches by 100 feet, with a heating period of 2 hours, and a firing rate of 90 M c.f. per hour.

In the tin mill, eight pair furnaces and eight in-and-out type sheet furnaces,

provided with complete recording equipment, have been converted to gas by the installation of combination burners. Likewise in the sheet mill there have been converted five pair furnaces and five in-and-out type double chamber sheet furnaces.

The open hearth furnaces in the foundry, though smaller, are of the identical type as the larger ones above described, and are now gas-fired. Four mold drying ovens, 17 feet by 20 feet, i. d., are fired with Denver Fire Clay gas burners, providing a maximum temperature of around 800° F.

Equipment described in the following paragraphs was converted to gas firing during the first year after the introduction of natural gas fuel into this territory, and the entire conversion has demonstrated the efficiency with which the fuel can be adapted to industrial purposes.

There are three boiler rooms in the plant, the main one having two 250-hp. B. & W. water tube boilers, supplying steam for the rolling mills and open hearths. The second is equipped with a 150-hp. Heine boiler, supplying steam for the pickling and other steam requirements in the sheet and wire mills. The third has two 250-hp. B. & W. boilers taking care of the steam requirements in the tin mills. All of the boiler equipment is fully automatic, with the gas supply controlled directly by steam pressure. Furnaces and ovens include 17 box type annealing ovens, eight of which are in the sheet mill and nine in the tin mill. Wire mill equipment includes a wire annealing furnace, a wire galvanizing pot, a wire baker, spring wire patenting furnace and pot annealing furnaces. Nail mill equipment includes bluing furnace and galvanizing furnace. Foundry equipment includes core ovens, pit mold drying and ladle heating. Two continuous sheet galvanizing pots in the sheet mill, eight tinning pots and a scruff furnace in the tin mill, a warm air heating plant to maintain a constant temperature in the tin mill warehouse, and numerous smaller installations of forging, tempering, and hardening equipment for machine shop and repair use complete that portion of the plant's equipment.

Box annealing in the sheet mill, which was established in 1924, was the first of the processes to be converted to gas firing. This mill has equipment consisting of five jump roughing, five finishing stands, and three cold rolled mills with pair, sheet and annealing furnaces.

After the sheets have been hot rolled, sheared, opened and cold-rolled, it is necessary to anneal them at a temperature of from 1300° to 1400° F. The sheets are stacked on a cast steel annealing box bottom and over this is placed a cast steel annealing box, the bottom of which is sealed with sand to exclude air. The box is then placed in the annealing furnace.

To insure even temperature and heat distribution, the furnace is fired at all four corners, the gas burning in a semi-muffled chamber along each side of the furnace at the floor level. The muffle wall extends about halfway up the inside of the furnace, the gases being drawn over the wall and around the boxes to the flue in the center of the furnace floor. Temperature recorders are provided and the furnaces are manually controlled with all four burners operated from one valve. High pressure type burners are used.

When the sheets have been annealed for the required length of time, the annealing box is withdrawn from the furnace. On certain special grades of sheets, it is necessary that they be heated in a deoxidizing atmosphere. This is accomplished by connecting a gas line through a special fitting and introducing raw gas into the boxes. This prevents oxidation of the sheets and reduces any oxide that may have been present.

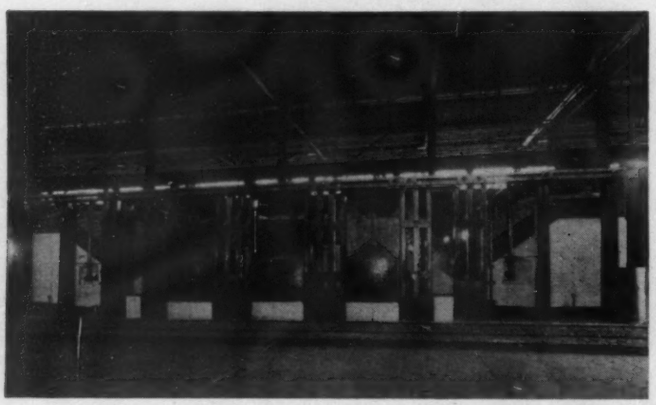
In the sheet galvanizing process the sheets are introduced into the pots by mechanical means, carried down through the molten zinc and through the "exit" rolls onto an endless chain conveyor to the inspection table. The zinc is kept molten by impact burners, firing along the sides of the pot and into flues which parallel the pot, transferring the maximum amount of heat to the molten zinc.

The tin mill, in operation since 1929, consists of eight mills, equipped with modern mechanical doublers, trip shears, man coolers, and sheet and continuous pair furnaces. After tinning, the sheets are introduced into a bath of palm oil, which is also heated by an auxiliary gas burner.

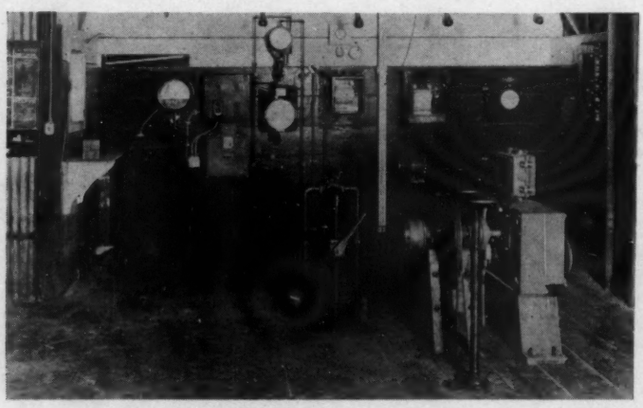
Sweating of the finished tin plate due to temperature changes is prevented by maintaining a uniform temperature in the storage room by means of an automatically controlled gas-fired warm air furnace, the warm air being distributed by an efficient air duct system.

In the wire mill, a low arch furnace, 60 feet long, is used for wire annealing prior to galvanizing. This furnace is fired by 32 tunnel burners firing across the furnace tangent to the arch, and staggered 16 to each side. The wire moves along the hearth where it is heated by the over firing and a slight pressure is maintained throughout the length of the furnace to guard against the infiltration of air. These burners are also controlled manually, valves being arranged so that the heat may be raised or lowered in any one of three zones or in the entire furnace as a unit. Pressure gauges are located at every control point on every installation, enabling the operator to predetermine his gas input accurately. The wire baking oven, gas-fired, requires a comparatively

*(Continued on Page 55)*



**Battery of gas-fired open hearth furnaces at Pittsburg, Calif., plant of Columbia Steel Co.**



**Recording instrument set-up for one of the open hearth furnaces, registering gas flow, temperatures and draft.**

### Federal Public Service Corp. Absorbed by New Utility

American Utilities Service Corp., of Chicago, recently incorporated under the laws of Delaware, has absorbed the assets and properties of the Federal Public Service Corp., also of Chicago.

Properties of the company transferred to American Utilities Service Corp. are the Wisconsin Southern Gas Co., operating in Burlington, Lake Geneva, Elkhorn and Delevan, Wis.; Calumet (Mich.) Gas Co.; Petoskey (Mich.) Gas Co.; Charles City (Iowa) Gas Co.; Federal Public Service Co. of Iowa, Perry, Iowa; Gas Utilities Co., Robinson and Galena, Ill.; Northwestern Illinois Utilities Co., Savanna, Ill.; Federal Public Service Corp., Ashland, Ky.; Vicksburg (Miss.) Gas Co.

Officers of American Utilities Service Corp., are P. O. Crawford, president; Mord Bogie, vice-president; E. G. Waters, vice-president in charge of operations; Helmer Hanson, secretary; and F. A. O'Neill, treasurer.

### Provide for Revoking Texas Pipe Line Permits

The State Railroad Commission of Texas has adopted amendment to Rule 36 of its regulations to provide that permits of pipe line companies may be revoked for failure to operate in accordance with state conservation laws. The rule specifically states that permits may be revoked after 10 days notice and hearing if in the judgment of the commission the operator of the pipe line is "wilfully violating or contributing" to the violation of the conservation statutes. Another amendment provides that before the commission may call a hearing on the proposed revocations of a permit for operation of a pipe line in a manner likely to cause waste, it first must give five days notice to permit the pipe line company to correct the conditions.

### Newspaper Survey Reveals that Editors Oppose T.V.A. Policy

Announcement by the United States News of the result of a survey to determine the attitude of the newspapers of the country toward the Tennessee Valley public power program, states that 40 per cent of newspapers are favorable and 60 per cent unfavorable in their opinion. The 60 per cent are reported to be alarmed over the safety of investments in utility properties, and that, while the development has been called a "yard stick" by which to measure reasonable rates for electric current, there is a growing conviction that the project is an entering wedge for wide application of public ownership.

### Missouri Utilities Appointments

C. S. Cleveland, manager at Columbia, Mo., for the Missouri Utilities Co. of St. Louis, has been transferred to the company's district office at Cape Girardeau, Mo.

J. E. Aitken, former manager of the Newark (Ohio) Consumers Gas Co., succeeds Mr. Cleveland at Columbia.

### Guy M. Johnson in Promotion

Guy M. Johnson, manager for the Northern Indiana Public Service Co.'s South Bend, Ind., district office, has been appointed general superintendent in charge of the production, transmission and distribution of gas for the company's entire system.

# Conclusions from 7 Years Experience with Employee Sales Activities

• H. E. DEXTER, Central Hudson Gas and Electric Corp., Poughkeepsie, N. Y.; addressing 1934 A.G.A. Annual Convention.—(Abstract by WESTERN GAS).

AT THE present moment very few utility employees are really sales minded, not because they do not want to see their company progress, but because they have not been made to realize the value of additional business and the importance of the company's continued prosperity to them personally. The industry has reached the point today where, to exist, it must sell gas not only for cooking but for water heating, auxiliary heating, and space heating, to a market where the family income is $1500 or less per year. In general over half the customers are in this market, and so far use gas only for cooking and some incidental water heating. This low income market will require more education and sales effort, not only on account of its size but because the general opinion of people of this class is that gas is too expensive and beyond their means.

Manufactured gas companies average one employee for every 131 customers. If this employee were actively sales minded it is evident that his contacts could reach a good portion of his customer group. The average employee is well established in his community and has a circle of relatives, friends and acquaintances with whom he is in almost daily contact. He or she will have much more influence with these people than could be gained by any salesman except after a considerable period of time.

In general, an employee has a full time job and the question immediately arises as to when he is to do this sales work, which is over and above his routine daily task. Some meet customers in their daily work and by a word here and there can help along a sale without appreciably delaying their regular duties. However, for the most part, this extra work must be carried on after working hours and in time that is the employee's own.

Since their inception in October, 1927, employee selling activities of the Central Hudson Gas and Electric Corp. have ranged from comparatively easily sold low-priced goods to higher priced replacement appliances. Compensation ranged from 15- to 20 per cent of the selling price of the article, sometimes as straight commission and sometimes as commission plus bonuses or prizes. As a result of these activities the following conclusions have been drawn:

Employee selling has real possibilities but requires much more supervision in the follow-up than any regular sales plan. Its success depends almost entirely upon the enthusiasm of the employee group during the activity. Generally speaking, this kind of selling is most effective if carried out on the basis of one or perhaps two campaigns a year, with a lapse of two or three months between drives to allow the employees to get back to normal and to a point where he may be again roused to enthusiasm.

Some method by which the employee turns in leads for the sales organization to close will usually create a wider interest in the employee group, as this method requires less effort on the part of the employee. This kind of a plan has real value, but it is somewhat difficult to draw up rules and enforce them to prevent paying commissions on leads (if a commission is a part of the plan) for prospects that a salesman is already trying to sell and which would perhaps have been sold just as quickly by the salesman's effort.

Such a plan has been successfully operated for two years by the Central Hudson Gas and Electric Corp., the dealers paying a large portion of the money paid for leads. The ultimate plan is one where the employee turns in the signed order. However, this plan will not interest any wide group of employees unless the price of the merchandise is below $25 and with a substantial commission, and unless it is a form of service which the customer needs at the moment.

High priced merchandise can be sold in off seasons by a limited group of employees with proper training and proper compensation. However, this is merely a matter of specialty selling and is really an auxiliary to the regular sales force. This does not have the value of enlisting the entire group of employees for the purpose of creating a mass opinion in the customer group.

If employees' activities are utilized and controlled properly, they can be of material help, not only by increasing the number of sales, but if employees actually sell, the selling cost per unit sale can be lowered appreciably. This is true because the inducements paid the employee do not have to be as high as the salesman's commission.

# Gas Dehumidifying Makes Possible Precision Printing in Baltimore Plant

• By BAYARD P. FONDA, Bryant Heater Co.
—(Abstract by WESTERN GAS):

AMONG the industrial weather conditions that adversely affect production schedules as well as quality of products are high summer and low winter humidities. Winter conditioning, by use of sprays introducing a controlled amount of water, is relatively simple; dehumidification is more complicated.

A pioneer industrial installation for year-'round control of humidity is located in Baltimore, Md., in the plant of the Waverly Press, nationally known printers of fine technical books and medical literature. The installation was designed by Howard H. Tunis, research engineer for the Waverly Press, and the writer, gas burners being installed and adjusted by Consolidated Gas, Electric Light & Power Co. of Baltimore.

Humidity control was essential in the Waverly plant, partly because of humidity effects upon paper stock, but principally because of variation, due to humidity in the thickness of cherry wood blocks on which the metal plates for making cuts are mounted. These wood blocks, because of their hygroscopic nature, contract and expand with changes of atmospheric conditions, making it extremely difficult to maintain the precision demanded in high grade printing.

The first step in the design of equipment was to study the exact behavior of the wood blocks with varying air temperatures and humidities. This was done with a specially designed instrument which measured changes in thickness of a cherry wood block in hundred-thousandths of an inch. It was found necessary, in order to keep a constant wood dimension with temperature increase, to increase the absolute humidity and slightly decrease the relative humidity. To cope with decreasing temperature the reverse procedure would be necessary.

The total volume of the conditioned spaces in the Waverly plant is 134,000 cubic feet, consisting of composing room and press room, the latter shown in Fig. 1. Humidity reduction is provided by a gas silica gel dehumidifier which treats 4,000 cubic feet of fresh air per minute. This equipment removes approximately 65 per cent of the moisture from this air, after which the air is moderately cooled and delivered to the various spaces in the plant to be conditioned. Cooling of the dehydrated air is accomplished by direct surface coolers, using city water at a temperature of 72 degrees. No further cooling is required, but a total of 15,000 cubic feet per minute of air is recirculated locally in the rooms to secure uniform ventilation. Since the thermal capacity of the building is large, the inside temperature rarely exceeds 88 degrees, regardless of outside extremes. An absolute humidity of 72 grains per pound of dry air is provided, and this corresponds approximately to a relative humidity of 40 per cent at a temperature of 85 degrees.

The gas-operated dehumidifier design is basically that worked out under the sponsorship of the American Gas Association Research Committee, being of the continuous rotary type. Reactivation of the silica gel takes place in one sector of the rotor, through which is drawn by means of the activation fan, a stream of heated air. The effluent moisture-laden air is discharged to the outside atmosphere. In another sector of the rotor, simultaneously with the above operation, fresh air is being dehydrated by the gel. Subsequently, this air is cooled by tap water, as explained above, and fed into two main dry air supply ducts. The rotation of the absorber or container for the gel beds, which has a circumferential drive, continuously feeds beds of gel reactivated by gas heat into the absorbing sector and saturated gel into the reactivating sector. This results in continuous operation when and as needed.

The complete air treatment and flow scheme is shown in Fig. 2. The selection of a hygrostatic control presented quite a problem, since it was necessary to maintain an arbitrary atmospheric condition as already discussed. Each of the two conditioned floors has a main dry air supply duct equipped with an automatic damper. A human hair humidistat on each floor operates a damper motor to shut off the supply of dry air when the humidity drops to the humidistat setting. When both humidistats are satisfied, the two dampers automatically open to furnish a supply of fresh air and the dehumidifier automatically shuts down. These humidistats, however, are really secondary or actuating controls. The primary control consists of a series of wooden blocks, identical to those used on the presses, so arranged as to greatly magnify any deviation in block thickness. The motion resulting from such deviation is transferred to the adjusting arm of the humidistat, thus shifting the working range upward or downward as required. The "high" contacts on the humidistat open the dry air dampers, and the "low" contacts turn on the sprays in the several humidifier units which are installed. There is, of course, a normal or neutral floating point, where neither the humidifiers nor the dehydrator are called upon to operate. With this arrangement the blocks themselves dictate

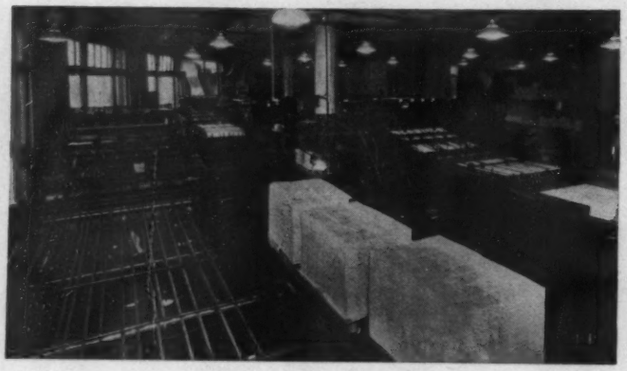


FIG. 1. Press room in Baltimore plant of Waverly Press, process air conditioned by gas.

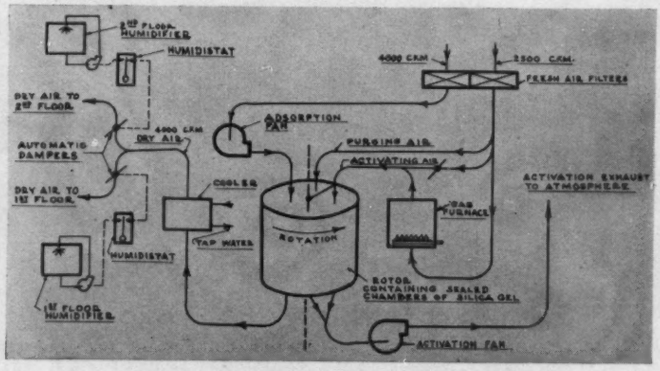
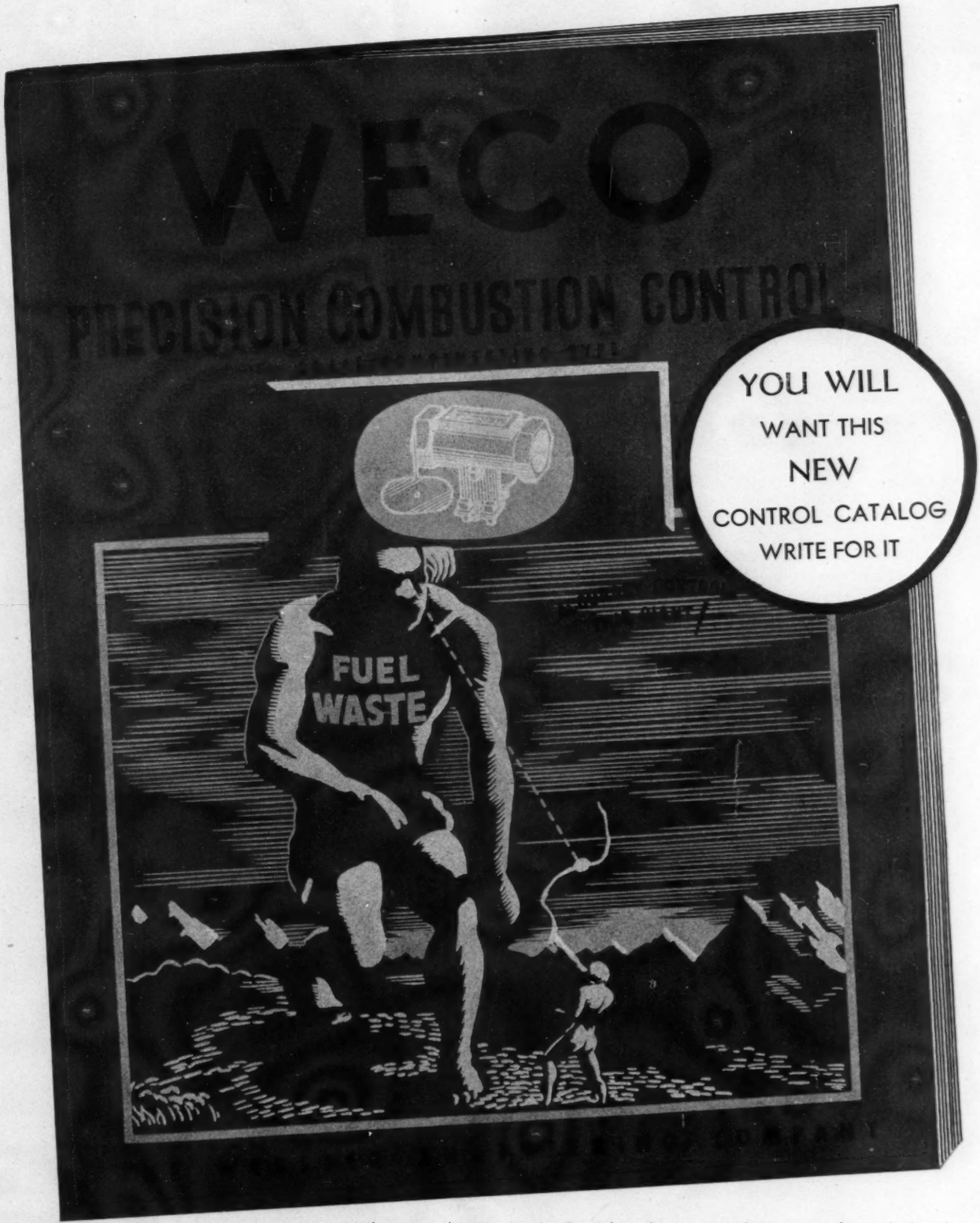



FIG. 2. Schematic diagram showing air treatment and air flow to first and second floors.

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the proper atmospheric condition for maintaining constant block thickness.

The maximum hourly operating quantities of gas, power and water required for continuous operation of the dehydrator are 900 cu. ft. of 500 B.t.u. gas, 4 kw.-hr. of power, and 240 cu. ft. of 72 degree water. It has been found that under the worst outside conditions, the dehydrator operates approximately three-quarters of the time.

A study of one month under controlled atmosphere revealed that about 600 cuts were printed and not one was removed from press because of block thickness. With uncontrolled atmosphere, over 25 per cent of blocked cuts had to be removed and corrected for type height.

# Dew Point Method for Determination of Water Vapor in Natural Gas

● L. E. WOODRUFF, The Texas Co., Long Beach, Calif.; addressing California Natural Gasoline Association, Los Angeles, October 4, 1934.—(Abstract by WESTERN GAS).

THIS method and apparatus for the determination of water vapor in natural gas discussed below refer particularly to gas under atmospheric pressure or less, in which cases the quantity of vapor contained may constitute an appreciable portion of the metered volume so that its consideration is of importance.

*L. E. Woodruff*

If the gas at the plant intake is known to be saturated, its water vapor content can be easily calculated, but in general, in order to make a careful check, it is necessary to employ some means for its determination. A simple form of the dew point hygrometer has been found satisfactory for this purpose.

The aqueous dew point of a gas is defined as the temperature at which the partial pressure of water equals its vapor pressure. A gas under such conditions is said to be saturated, and any decrease in temperature will cause water to be condensed.

In the determination of the dew point, advantage is taken of this fact by directing a stream of the gas to be tested against a polished metal surface, which is then cooled until dew is seen to appear. The mol fraction of water vapor is readily determined as the ratio of partial pressure to total pressure.

An apparatus which has been in use for some time, and which can be constructed at little cost from materials most of which are available in any laboratory is shown in Fig. 1. It consists essentially of the following parts:

A - A glass cylinder through which may be drawn the gas to be tested. It is connected to pipe fittings at the lower end with rubber tubing, and at the upper end by means of a rubber stopper through which is inserted a ⅜-inch nipple. For this part the water jacket from the burette of a Hays gas analyzer was used.

O - A glass orifice.

M - A manometer giving the differential pressure across "O" and indicating the velocity of flow through "A".

$V_1$ - A ⅛-inch needle valve for regulating the flow through "A".

C - A chromium-plated, copper condensing bulb. It is connected to valve "$V_2$" by means of a piece of rubber tubing, a ⅛-inch nipple threaded through the ⅜-inch fittings, and a glass tube passing through a rubber stopper. This arrangement makes possible the control of the temperature in "C" by the evaporation of refrigerant therefrom. The approximate dimensions of the bulb are: length, 2 inches; diameter, ⅞ inch; wall thickness, 3/64 inch.

T - A thermometer indicating the temperature in "C". Copper wool, packed around the bulb, acts as a heat conductor between it and the walls of "C".

In making a determination, 5 ml. of ether is first introduced into the condensing bulb "C" through the rubber tubing connection. The instrument is then connected to the sample tap and vacuum pump.

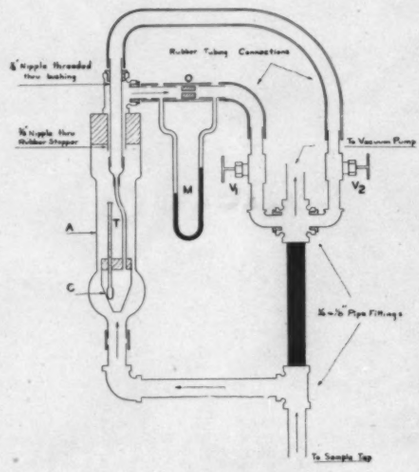



FIG. 1.

With the sample tap valve open wide, valve "$V_1$" is cracked open and gas is drawn through the apparatus at a rate sufficient to cause a differential pressure across "O" of about 2 inches of water. This corresponds to a flow of about 0.03 cu. ft. per hour at atmospheric pressure, and is not sufficient to cause any appreciable pressure drop through the apparatus.

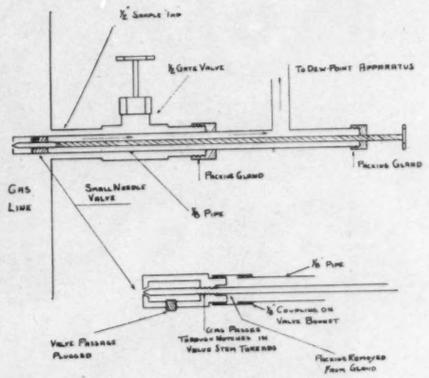



FIG. 2.

When the air is purged out, valve "$V_2$" is cracked open and the ether evaporated so that the temperature in "C" is slowly lowered. At the first appearance of dew on the polished surface of "C" valve "$V_2$" is closed and the temperature noted. With valve "$V_2$" closed, the evaporation of ether is stopped, and the temperature in "C" will rise. It is noted again when the dew disappears. The dew point is taken as the mean of these two temperatures.

These operations are repeated until successive determinations check to within 1° F. and the temperatures of appearance and disappearance of dew do not differ by more than 5° F.

It is possible to make determinations on gases flowing at relatively high pressures by altering the procedure somewhat. The sample tap valve is pinched and used as a pressure reduction valve, the gas then being drawn through the instrument at a suitable pressure and determinations made as before. This lowers the dew point, but does not in any way affect the mol fraction of water vapor, which is calculated as the ratio of the vapor pressure of water to the pressure in the instrument.

If the dew point of the gas is above atmospheric temperature, water may condense out in the sampling line ahead

# WHAT OTHER RANGE offers so many features, in so compact a space, at so compact a price? Campaigning Estate's "Perfect 36" is the perfect prescription for increased range sales this year.

The Grid-All grills hamburgers, cube steaks, wieners . . . bakes pancakes . . . right on range top. A hinged, enameled cover forms a handy table-top space when Grid-All is not in use.

Lots of room for necessary culinary utensils in the big swing-door utensil compartment.

Waist-high, drawer-type broiler makes broiling easy as frying. Smokeless, double-searing pan.

## . . . . and what other gas range line has so many Potent Selling Points?

★ FRESH-AIR OVEN ★ SINGLE-DIAL OVEN CONTROL ★ LEVERACKS ★ WAIST-HIGH BROILER ★
★ DOUBLE-DUTY COOKING-TOP BURNER ★ UTILITOASTER ★ ADJUSTABLE LEGS ★

THE ESTATE STOVE COMPANY . . . . HAMILTON, OHIO

Warehouse stocks in Los Angeles, San Francisco, Portland, Minneapolis, Dallas

of the apparatus and in the glass cylinder "A" of the apparatus itself, and a true sample will therefore not be obtained. It is then necessary to remove the sample at a pressure which is sufficiently low to bring the dew point below the atmospheric temperature. This may be done by means of a special sample tap such as the one shown in Fig. 2.

The tap itself is made of ⅛-inch pipe and is so constructed that it can be inserted into the center of the line through a ½-inch gate valve. By means of the small needle valve, the pressure is reduced at a point inside the line before the gas comes in contact with the cooler atmosphere.

The design of this particular apparatus does not make it possible to determine dew points below 40°F. or at pressures in excess of atmospheric. This limits its applicability to gases which contain water vapor in excess of 0.8 per cent.

Experiments were conducted to determine the accuracy of this instrument. The experimental method consisted of saturating gas with water vapor at a known temperature, and then superheating it and determining its dew point—the difference between this determined dew point and the known saturation temperature being a measure of the accuracy of the determinations. Determinations were made over a range of temperatures from 39°F. to 69°F. and over a range of pressures from 38 mm. to 759 mm. Hg. abs.

An examination of the resulting data reveals that with but few exceptions the indicated dew point is too low, and that in a series of 33 determinations the largest error was 1.5°F.

# Survey Shows Wide Variation in Gas Home-Heating Sales Practices

THERE is a startling lack of uniformity in the sales policies and methods of gas companies, as regards sale of home-heating equipment. This is a primary conclusion from an extensive mail survey, recently concluded by the Roberts-Gordon Appliance Corp., Buffalo, New York. An inquiry blank was mailed to 250 of the larger gas companies seeking information on a broad list of subjects. The survey obtained an excellent response, and the resulting summary of data bearing upon sales practices in this field should be of interest and value to gas heating executives. From a summary prepared by W. S. Gordon, Jr., president, the following condensed recapitulation of replies on important heads has been prepared by *Western Gas*. Percentages shown in connection with the various subjects represent the per cent of reporting companies which follow the practices as listed.

*Sales Organization and Duties*

By whom gas-home-heating sales are handled: 52% special home heating department, 48% regular salesmen or sales department.

Number of salesmen employed: 71% less than 10 men, 29% more than 10, two companies 35 to 50 men, one company 268 men; 85% retain all salesmen throughout the year, 15% retain from 83% to 25% of salesmen throughout the year; 52% have salesmen confine activities to gas-home-heating during heating season.

Where new salesmen are obtained: 31% from own sales force, 17% from heating trades and other companies, 3½% from newspaper advertising and personal contacts, 21% from miscellaneous sources, 27½% no answer.

Men trained before being sent out: 83% yes, 6% no, 11% no answer.

Subjects comprising training material, in order of importance: 45% general information on heating, industry, engineering and estimates, 26% general salesmanship, heating and engineering, 8% company policies, 4% general salesmanship, 2% merchandise information, 2% cost and advantage of gas heat, 13% no answer.

Length of training period: 13% until qualified, 11% for one month, 9% one week, 9% two weeks, 9% two months, 8% one year, 8% continuous, 4% three months, 29% no answer.

Basis of salesmen's compensation: 59% salary and commission, 31% straight salary, 6% straight commission, 4% no answer.

*Sales Control*

Standard day's work and what it is: 61% no standard daily sales task; 15% "it varies"; 11% eight hours; 2% seven hours; 22% daily task based on number of calls per day ranging from—2% five calls, 9% seven to eight calls, 5½% 10-12 calls, 5½% 15-20 calls; one company eight heating jobs per month.

To whom salesmen report and how often: 28% district manager, 14% supervisor, 37% sales, commercial or new business manager, 17% superintendent or engineer of gas heating sales, 4% miscellaneous executives; 81% report daily, 7% two to four times daily, 6% weekly, 6% no answer.

Number of calls per man per day: 26% one to five; 26% six to ten, 15% from 15 to 30, 24% no answer. Number of interviews and presentations: 35% four to seven, 21% one to three, 13% 10 to 14, 5% 16 to 22, 2% "it varies," 24% no answer. Old customer calls: 33% one to two, 26% three to five, 4% eight to ten, 2% "it varies," 35% no answer. Number of surveys: 54% one to four, 34% no answer, 6% less than one, 6% from "none" to eight. Night calls: 30% one, 24% two to three, 7% "less than one," 4% "it varies," 2% none, 33% no answer.

*Sales Equipment*

Sales manual, fact book or visualizer used: 69% yes, 22% no, 2% "sometimes", 7% no answer.

Kind of "selling tools" used: 39% manufacturer's catalog data and literature, 18% sales manual, 11% pictures and descriptive matter, 7½% book of "actual costs and illustrations of installations", 7½% "visualizer", 4% projection machine and film, 13% no answer.

Size of sales book: 56% 8½x11, 18% miscellaneous odd sizes, 6% pocket size, 20% no answer.

Installation record book helpful: 80% yes, 7% "depends upon book", 4% no, 9% no answer.

*Sales Meetings*

Sales meetings held: 93% yes, 7% no.

Frequency of meetings: 26% daily, 24% weekly, 13% two to three times per week, 9% monthly; 9% "regular intervals when needed," 8% "infrequently," 4% semi-monthly.

Time of meetings: 58% morning, 22% evening, 5% afternoon, 6% no choice, 2% "all day".

Compulsory attendance: 87% yes.

Duration of meeting: 42% less than one hour, 39% one to three hours, 8% "it varies", 2% "all day", 2% one to two days twice a year.

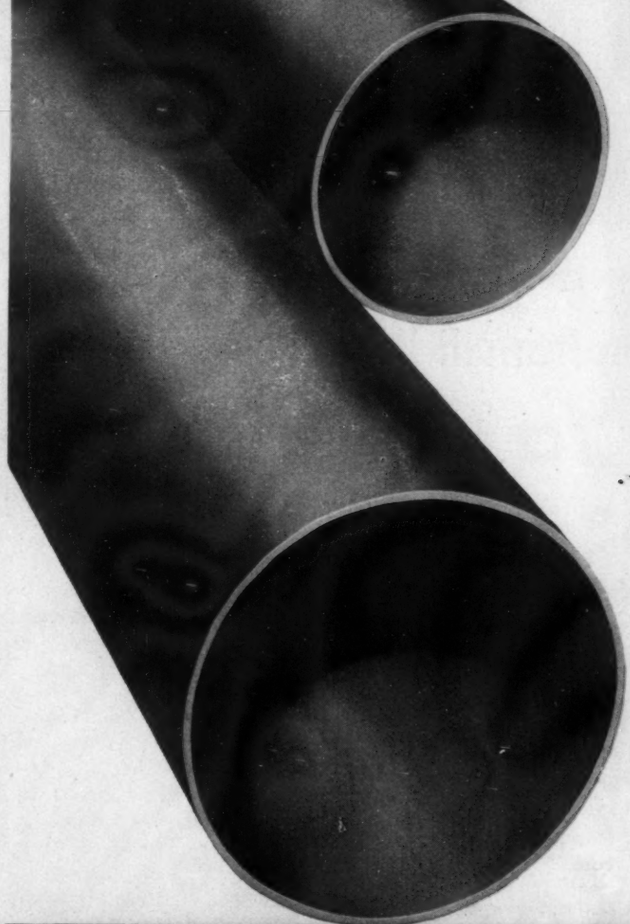
*Advertising*

Advertising done: 91% yes.

Use of newspapers: 28% spend 80% to 90% of appropriation, 20%

# ALL THESE ADVANTAGES ARE COMBINED ONLY IN STEEL GAS MAINS

*and together they mean*



## RELIABILITY *to the highest degree*

No one quality or advantage but rather a combination of several must be incorporated in pipe for gas mains, if it is to meet the exacting demands of modern service. NATIONAL Steel Pipe has the qualities important for such use. Easy installation, low maintenance cost, long service, maximum safety, are provided when NATIONAL is specified.

High tensile strength and extraordinary ductility make NATIONAL steel mains reliable under vibration and shocks of traffic, cave-ins, trench pressures and settling of filled ground. Superior quality, adaptability to all types of joint, and fewer joints per mile speed up laying operations and on completion reduce interruptions of service to a minimum. All gas line pipe is tested and inspected to the rigid requirements of the A.P.I. specifications. Thus, true economy and satisfaction are obtained to the highest degree. For severe corrosive soil conditions, various coatings and linings are available. Questions concerning steel gas mains will be gladly answered by the engineering and technical departments of the largest manufacturer of tubular products in the world.

NATIONAL TUBE COMPANY • Pittsburgh, Pa.
*Pacific Coast Distributors*—COLUMBIA STEEL CO., San Francisco, Calif.
*Export Distributors*—UNITED STATES STEEL PRODUCTS CO., New York, N. Y.

*United States Steel Corporation Subsidiary*

NATIONAL
# STEEL GAS MAINS

spend, 60% to 75%, 13% spend 45% to to 50%, 24% no answer.

Radio broadcast: 85% no answer (slight interest indicated).

Most effective appeal: 32% convenience, 15% cleanliness, 13% automatically controlled heat, 5% labor saving, 5% comfort, 5% economy, 4% price and terms, 4% cost, 2% health, 15% no answer.

Advertising medium bringing best results: 48% no answer, 23% newspapers, 16% direct mail, 9% personal contact, 2% handbills, 2% counter and window displays.

Outside advertising counsel: 43% yes.

*Sales Contests*

Syndicated, standardized advertising: 9% yes.

Sales contests conducted: 67% yes, 5% no.

Duration of contests: 30% one month, 20% one to three months, 7% three to five months, 33% no answer.

Frequency of contests: 47% no opinion, 17% three to four per year, 13% one per year, 9% two per year, 9% every month, 5% "varies".

Type of rewards: 35% no opinion, 35% cash, 15% honor awards, merchandise and trips, 15% combination.

Results of contests: 39% no opinion, 57% helpful, 4% questionable.

*Canvass and Presentation*

Territory division: Salesman plan own routes, 80%. Definite territories, 76%.

Prospects: Prospect cards used, 37%. In 22% of the companies 10% to 20% of the men's prospects are leads; in 19% of the companies, 40% to 50% of the men's prospects are leads; in 13% leads average 60% to 70% of a man's total prospects. Employees top the list as sources of leads; display room leads rank second; advertising third.

In 46% of the companies, outside men spend some time on floor; in 45%, they do not.

Call on husband or wife first: 69% wife, 20% vary, 9% no opinion, 2% husband.

*Survey, Estimate and Proposal*

Approach on cold canvass calls: 35% educational story, 32% "let us make a free survey", 26% vary; one company, free book on basement improvement.

Form of estimate: 55% "long", 19% "short", 26% no reply.

Departments making "long" form: 36% engineering, 34% sales, 20% house heating, 10% "gas superintendent".

Presentation of estimate or proposal: 50% written, 40% verbal.

Cost data left with prospect: 45% yes, 42% no, 7% "sometimes", 2% "when requested".

Compare total cost of other fuels with gas: 42% yes, 40% no, 18% no answer.

Time between first call and follow-up: 26% no answer, 31% "it varies", 28% within a week, 5% in 10 days, 4% within 30 days.

*Selling Plan*

Sell on trial: 42%.

Payment plans: 37% cash or monthly payments, 24% easy monthly payments, 2% cash or monthly lease, 9% monthly lease, 24% all three ways, 4% no answer.

Sales price: 2% $60; 9% $75-$105; 13% $120-$130; 13% $135-$150; 15% $150-$170; 7% $190-$195; 5% $210-$225; 4% $275; 2% "varies"; 30% no answer.

Amount of monthly payments: 7% $2-$3, 15% $3-$5, 7% $6-$7.50, 9% $8-$10, 2% $15, 60% no answer.

In approximately half of the companies use of gas for heat can be terminated by the customer on terms favorable to him: 20% "any time on request", 15% "if not satisfactory", 5% any time during first year, 2% when equipment is paid for, 2% after one season's trial, less $24 cancellation charge, 2% "must use burner two heating seasons".

Only 26% of the companies offer to budget gas bills to equalize the monthly payments.

Comparison of actual bills with estimate: 60% "very close", 33% under estimate, 2% five per cent high.

Burner installation: 54% made by company, 30% made by dealer, 16% "it varies".

*Competitive Fuels*

Chief competitor: 61% coal, 21% oil, 5% wood, 2% sawdust.

Fuel trend: 44% toward gas, 23% toward coal, 13% toward oil.

*Prospects' Objections to Gas*

Cost, 93%; fear of rate advance, 2%; no answer, 5%.

# Combating the Competitive Situation in Large and Small Bakeries

● **FRANK H. TREMBLY, JR., Philadelphia Gas Works Co.; in paper to Industrial Gas Section, American Gas Association, 1934 Annual Convention.—(Abstract by WESTERN GAS):**

THE present situation in the baking field can be summarized in two general statements: 1st, improvements in the application of other fuels to baking processes have materially increased the intensity of competition; 2nd, many existing gas installations from both an equipment and an adjustment standpoint are operating below their point of maximum fuel efficiency.

Aside from the development of the indirect-fired gas traveling oven, there have been no appreciable improvements in recent years in the application of gas to baking processes.

In addition, the sense of comparative security with which the gas industry has viewed the baking load has led, in some instances, to the condonement of inefficient gas applications and improper adjustments, that would not have been permitted in a more highly competitive field. The same critical attention should be given to improvements in gas applications, better insulation, and more efficient burner equipment, as has been given in the past to the metallurgical field.

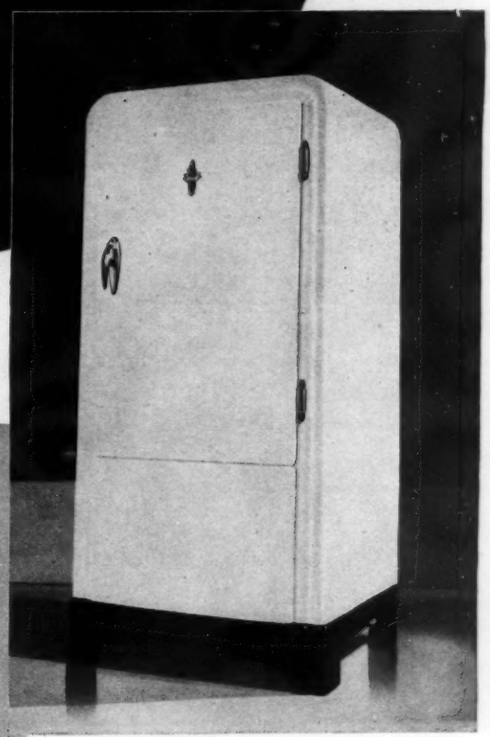
The greatest gas wastage in baking applications is caused by over-ventilation that is present to a considerable extent in practically all types of gas ovens. This can definitely be corrected by the application of improved burner equipment, proper attention given to better venting, and the elimination of excessive stack draft. The large direct-fired traveling oven represents a serious problem in this respect, that would justify a study by the industry as a whole, rather than isolated utilities, in order to determine the best method of improving this condition.

Recent years have shown a material increase in the effectiveness of the insulation applied to new gas ovens. There are many ovens, however, now on utility lines, that are improperly insulated, and which warrant either replacement or the application of additional insula-

ALL WHO HAVE SEEN THE NEW ELECTROLUX AGREE:

# 1935 is GAS REFRIGERATION'S YEAR!

USES NO WATER



**Good reason why gas companies the country over are organizing *early* to promote this modern use of gas... taking *full* advantage of powerful Electrolux advertising.**

Big new gains were made in Electrolux acceptance with the introduction of air-cooling in 1933. Last year followed through with even greater sales successes... increased popularity for this modern gas refrigerator.

Now with people again in a *real* buying mood . . . and with the new 1935 Air-Cooled Electrolux everywhere acclaimed "the *best*—and *best-looking*—refrigerator of them all," there's strong reason for confidence in the widespread belief that "1935 IS GAS REFRIGERATION'S YEAR."

**Look at these important sales features of 1935 AIR-COOLED ELECTROLUX**

**NEW BEAUTY**

**GREATER EFFICIENCY**

**ADDED CONVENIENCES**

**FAMOUS OPERATING ADVANTAGES**

### *New Sales Appeals!*

For the 1935 Electrolux is a refrigerator that any gas company can proudly offer its customers. Electrolux's distinctive design was created by American women themselves. Its worthwhile modern conveniences set a new high for refrigerator value. And, in addition, Electrolux offers operating advantages that are unmatched.

Every gas refrigerator you install publicizes this eminently modern use of gas . . . builds valuable good will for your company. And it does more! Each Electrolux sold goes a long way to insuring a permanently all-gas kitchen . . . adds 1500 cu. ft. to your monthly load . . . and gives a strong impetus to other gas-using appliances.

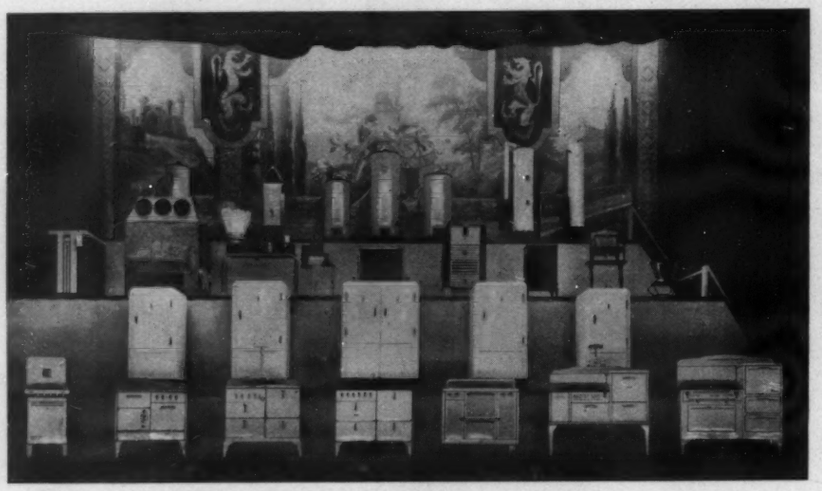
Today, make your plans for actively merchandising Electrolux in 1935. Get the beautiful new models on display on your floor—in your windows! Remember: *1935 is gas refrigeration's year!* Cash in on it from the start! For sales and merchandising assistance, write—wire—or phone Electrolux Refrigerator Sales, a division of Servel, Inc., Evansville, Ind.

NEW *Air-Cooled*
ELECTROLUX
THE SERVEL *Gas* REFRIGERATOR

tion, in order to reduce fuel costs. In such cases, it is often to the utility's interest to approach the baker with a proposal to replace or rebuild his oven, with the cost to be paid for out of savings, established on a definite monthly basis.

Inefficient gas applications, particularly to the brick type ovens, represent an invitation to competition that in some cases, can only be overcome through new applications that as yet have not been perfected. In the natural gas districts, this class of oven represents a considerable portion of the gas load, and it would warrant concerted action on the part of the utilities to develop a more efficient application, in order to offset competition.

The industry should be aware of customer preferences for distinct oven types, such as the individual deck-controlled cabinet oven. The acceptance of such an oven by a considerable portion of the smaller classes of bakers should be all the incentive necessary to develop additional gas-fired ovens of this type, and to establish such an oven as a typical gas application.



## Appliance Stage Show Opens Portland Campaign

THIS striking display of 1935 models of gas appliances was a colorful feature of the dinner meeting at which Portland Gas & Coke Co. launched its sales campaign, January 28. Nearly 1,000 persons, including 300 appliance dealers and all members of the company's organization, attended the meeting, which was held in the Masonic temple. The curtain first went up to show the tier of gas ranges, with a pretty girl from the company's offices standing by each. Successive tiers were then revealed as buglers blew a call to attention. Features of the new appliances were explained by heads of the various sales divisions, speaking into a portable microphone over a public address system as they went from appliance to appliance. B. H. Parkinson, commercial manager of the Portland company, outlined the idea for the stage show, which was carried out by Glen Herald, who designs the company's displays. Participating in the presentation were W. D. Hostetler, manager of residential sales, C. R. Gibbons, house heating sales engineer, and Joe Ingram, field sales representative.

### "Prosperity Contest" To Be Spring Gas Refrigerator Sales Activity

Plans for a nationwide gas refrigerator sales campaign under sponsorship of the American Gas Association Refrigeration Committee during April, May and June of this year were approved at a meeting of the Committee held in New York City on January 7, at A.G.A. headquarters in the Graybar Building. John J. Quinn of the Boston Consolidated Gas Co. is 1935 chairman of the Refrigeration Committee.

The forthcoming spring campaign to be known as the "Prosperity Contest," is expected to be conducted on a much larger scale than that of the "Go-Getter Contest" in the spring a year ago when six blue vases were bestowed as trophies to winning gas companies in addition to cash awards, it was announced after the meeting.

### Storage Water Heaters to Be Feature of 1935 Sales Campaign

Portland Gas & Coke Co. will feature storage water heaters in the company's 1935 sales and advertising campaigns, according to B. H. Parkinson, commercial manager. Billboards, direct-mail advertising, newspapers, truck banners, plumber dealer window displays in addition to gas company window and floor displays will be utilized.

Water heaters incorporating both slow recovery and quick recovery positions, manually controlled, will be featured in the campaign. Plumber members of the Oregon Gas Appliance Society will cooperate, offering the heaters at a contract price.

## New Insignia Chosen

SOUTHERN Counties Gas Co., Los Angeles, last month concluded a company contest to develop a new insignia, 118 sketches and designs being submitted by 52 employees. The winning design, shown in the accompanying illustration, was submitted by Carl Meredith, a welder employed in the company's Monrovia district. A somewhat similar design submitted by R. J. Klaasen, a construction foreman at Whittier, was awarded second prize.

The design features a high pressure holder, of a type originated by Southern Counties engineers several years ago, and now used in many communities throughout its system.

### A. G. A. Laboratory Requirements for Automatic Main-Gas Control Valves

After several years of research in collaboration with its requirements committees the American Gas Association Testing Laboratory is introducing a new service to the industry made possible by the recent approval of Listing Requirements for Automatic Main-Gas Control Valves. These new standards cover both electric gas control and diaphragm valves, and relate to both constructional features and performance characteristics.

Tests for construction under these requirements include an examination of such features as electrical connections, transformers, adjustment means, strength and durability of assembly, valve construction, and finish. Performance must be in accordance with the prescribed limits of operation and the device is subjected to such tests as leakage, capacity, life or continued operation tests, and checked for operation under variable voltage conditions.

### E. W. Bixby To Represent Pittsburgh Equitable and Merco Nordstrom

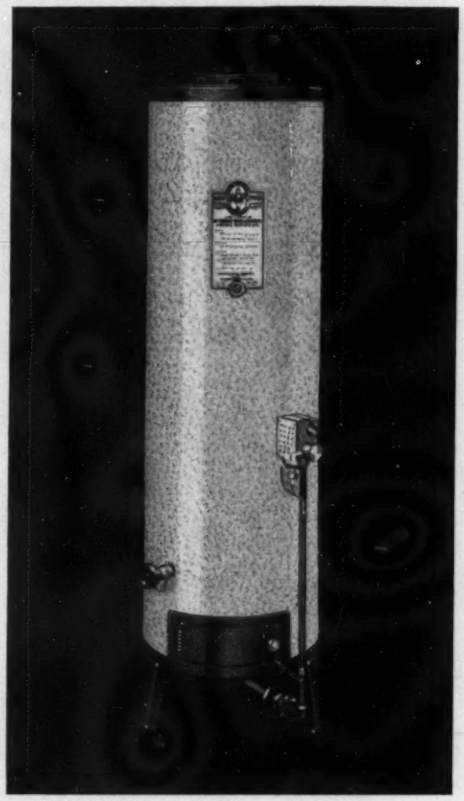
E. W. Bixby has become a member of the sales organization of the Pittsburgh Equitable Meter Co.'s recently opened office at 67 McCall street, Memphis, Tenn. He was formerly sales manager for the Columbian Iron Works at Chattanooga, Tenn., and is well known to the trade throughout the South.

Mr. Bixby will contact the trade in Chattanooga and other towns in Tennessee as well as in Kentucky, representing both the Pittsburgh Equitable Meter Co. and its subsidiary organization, the Merco Nordstrom Valve Co.

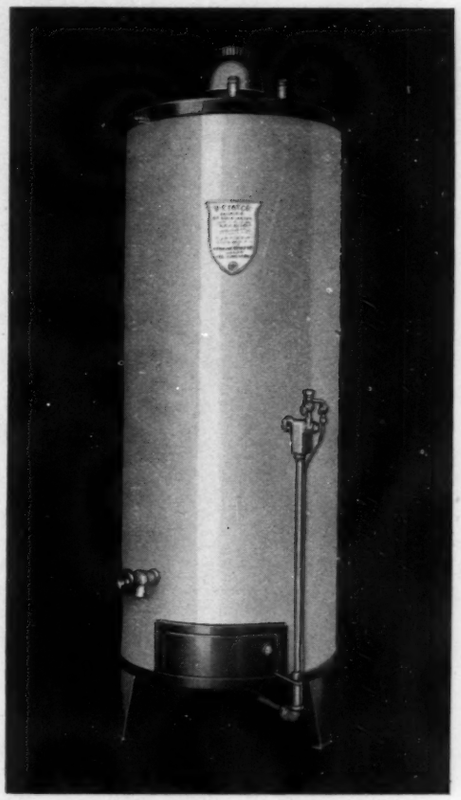
# FEATURE THESE TWO

# WATER HEATERS

## FOR 1935 SELLING



**A G P REGULAR** Gas-Fired Automatic Storage Water Heater: 5 sizes—from 20 to 75 gallons. Baked enamel steel jacket, ivory finish; Galvanized or Everdur tank; snap-acting, thermostatic pilot valve; only one gas connection required. Multiple flue type.



**THE DICTATOR** Low Priced Water Heater. A fine heater at a price that meets competition. Fully automatic, snap-acting thermostatic valve; patented jet type burner; baked enamel jacket and tank of Galvanized or Everdur. 4 sizes, from 15 to 40 gallons. Single flue type.

AGP

Every feature that helps sell automatic hot water is in these two heaters. Both are sturdily built — include full automatic control — are handsomely jacketed, thoroughly insulated and highly efficient; talking points which, in addition to other advantages, often help close the sale. Sales promotion material is ready now to help you display and feature these two heaters for immediate selling and more is being prepared. There's profit in selling A. G. P. Water Heaters. Write for the details today.

AMERICAN GAS PRODUCTS CORPORATION
DIVISION OF AMERICAN RADIATOR COMPANY
40 WEST 40TH STREET · NEW YORK, N.Y.

Bridge shown in raised position—note flexible gas connection.

# Maintaining Gas Service Over a Lift-Type Bridge

AN interesting piece of construction carried on recently by the Western United Gas & Electric Co. of Aurora, Ill., called for the service of gas across a lift bridge at Joliet. Details made available through the courtesy of E. E. Lungren, gas engineer for the company, are as follows:

Several years ago a 24-in. steel line was installed on the E. J. & E. stationary railroad bridge which spans the Canal at Joliet. Recently this bridge was changed from the stationary type to the vertical lift type in order to allow boats to travel in the Canal, and this change made it necessary to devise a new way of supplying gas. Several methods were given consideration. The first, laying the pipe on the bottom of the Canal was objected to by the authorities. A second method, that of building high towers and laying the line from one to the other, supported by either a solid beam or a steel rope, was prohibitive in cost. The method finally adopted was the use of a flexible steel lined hose. A picture of this hose, in position, is seen above.

This hook-up is made of two sets of two 30-ft. lengths of 8-in. marine hose, with bronze stiff female couplings, into which were inserted 8-in. heavy steel nipples with companion flanges threaded to the nipples, and the two lengths bolted together.

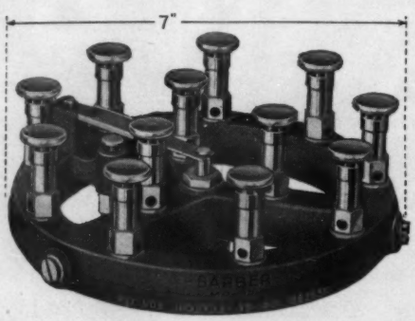
The hose itself is made up with a liner of extra heavy 8-in. asbestos-packed steel hose. To this liner the couplings are then welded and the hose put in the rubber mill where it is covered with a gas-resisting composition, over which is helically wound in the manner of a cable, a band of heavy steel wires which are in turn drawn taut and fastened at the other end. Another heavy layer of composition rubber is then vulcanized and entirely covered with a weather-resistant fabric. Wires, rubber and fabric are protected from slipping by extra heavy clamps bolted on each end.

This 8-in. hose makes a 22-ft. diameter arc. It is capable of withstanding a good deal more than the pressure called for, and the outside covering precludes any possibility of seepage of gas. The hose has a bursting pressure of around 600 pounds, with a safe working pressure of 250 pounds. Weighing about 27 pounds per foot, it is heavy enough to keep the hose assembly from waving in high winds and at the same time is light enough so that it does not put undue strain on the hose connections at any point.

The hose is fastened at each end of the movable span to a pipe laid on top of the bridge and held in position by "U" clamps. The outer end of the hose at each end of the bridge is fastened to a pipe which rises vertically from the base of the bridge to one-half the distance between the upper and lower limits of travel of the bridge, which is 30 ft.

## Barber Gas Burner Adds to Line of Special Burners

Barber Gas Burner Co., Cleveland, Ohio, has announced development of an additional line of burner units for special industrial and commercial uses. These new burners are




especially designed for use in such appliances as banana room heaters, circulating heaters, clothes dryers, coffee urns, coffee roasters, cone machines, floor furnaces, pop corn machines, garage heaters, hair dryers, laundry stoves, space heaters, steam tables, sterilizers, warming ovens, and water heaters.

A major feature in the new units is an automatic safety pilot control included as an integral part of the burner. Illustrated on this page is the No. M.P.-12 Barber burner.

## Sales Conference Month

*(Continued from Page 12)*

Speakers and their subjects, for the Technical Section on Wednesday, February 20, 2 p. m., are these:

"Humidifying and Oil Fogging Natural Gas"—By E. C. Kollock, chief engineer, Atlanta Gas Light Co., Atlanta, Ga.

"Leakage Survey and Estimated Repair Program, as Relating to Cast Iron Pipe"—By Carroll Diller, distribution engineer, Arkansas-Louisiana Gas Co., Arkansas, La.

"Cathodic Protection of Pipe Lines from Soil Corrosion"—By R. J. Kuhn, New Orleans Public Service Inc., New Orleans, La.

W. C. Grant, advertising manager of the Lone Star Gas Co., is chairman of the arrangements committee for the Dallas meetings, and C. K. Patton, new business manager of the Dallas Gas Co., is vice-chairman.

### PITTSBURGH CONFERENCE

The Eastern Regional Natural Gas Sales Conference covers natural gas sales activities in New York, Ohio, Pennsylvania, West Virginia, Kentucky, and in Canada. W. L. Hutcheson of The Manufacturers Light and Heat Co., Pittsburgh, is chairman of the council in charge. Sessions will be in the William Penn Hotel, Pittsburgh, on February 28 and March 1. Arranged for consideration at the two-day session are these subjects:

Gas Refrigeration from the Natural Gas Industry's Viewpoint
The National Gas Range Contest
Circulator Heaters—a Growing Market
Methods of Gaining and Retaining House Heating Customers
Unit Heaters—How and Where to Sell Them
The Application of Prepared Furnace Atmospheres
Gas Air Conditioning
Gas Flood Lighting
The Status of Commercial Load in Natural Gas Territories

Conference luncheons will be held on each day of the meeting.

J. W. West, Jr. is secretary of the A.G.A. Commercial Section, which for the past several years has conducted the helpful regional conferences for the sales branch of the industry. With sales objectives set high for 1935, and general expectations for an excellent sales year, a large and interested attendance is anticipated for each of the February meetings.

## Xmas Gas Range Sales Double 1933

Sales during the Christmas gas range campaign conducted by the Oregon Gas Appliance Society more than doubled the number reported in 1933, according to the Portland Gas & Coke Co. A total of 308 gas ranges and cookers were sold.

# *The New* DETROIT JEWEL and GARLAND Ranges *are now ready . . .*

ULTRA-MODERN
STRUCTURALLY IMPROVED

GARLAND
Cabinet Range No. 3581

Furnished in four colors. New line also includes a 36-inch Table Top, a 42-inch Table Top, and a smaller elevated oven range.

Anticipating the trend toward newer and more advanced styling in kitchen equipment, the 1935 line of Detroit Jewel and Garland gas ranges represents the finest we have produced in our many years of quality range building.

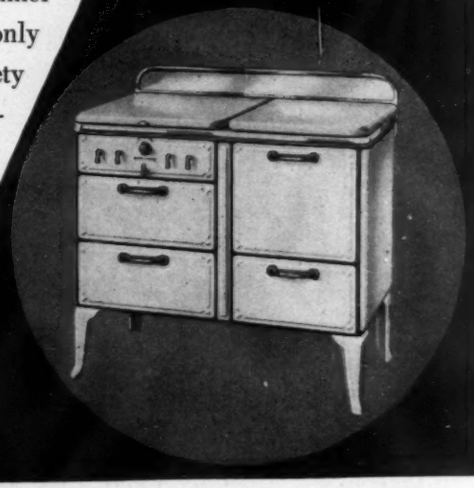
A choice of several color combinations are offered, all tastefully and artistically enhanced by chrome back guards, front strips, burner pan and broiler pan and rack, making these ranges particularly "eye appealing" and far more serviceable than any gas range heretofore offered to the buying public.

The general construction, too, has been greatly improved. New style burners, with simmering attachment and center lighting, are only one of the innovations of the 1935 line. Safety lock oven valves, new type burner box assembly and general all-over strengthening of the frame are other features of these remarkable ranges. The trims are different as are many other details of the new line.

If you are looking for a line of gas ranges that more nearly meets the demands of present day buyers, it will be well worth your while to write us for a price list and catalog.

DETROIT JEWEL
Senior 42-inch Table Top
No. 6520

Can be obtained with or without chrome trim in four colors. Detroit Jewels may be had in a smaller Table Top and a large and small Cabinet range.



## DETROIT-MICHIGAN STOVE COMPANY

DETROIT, MICHIGAN

# Lone Star's Long Lake Line in Service

GAS is now flowing through the Lone Star Gas Co.'s new 12-inch 70-mile line from the Long Lake gas field of southeastern Anderson County in east Texas, to Riesel, McLellan County. The line increases the daily capacity of the system between 30,000,000 and 35,000,000 cubic feet and assures adequate supply for the territory south of Joshua.

Gas from the line will give direct service to Bryan, College Station, Mart, Marlin, Reagan, Calvert and Hearne. The new supply will be available for Waco and the following towns on the Temple line: Hewitt, Lorena, Rosebud, Troy, Temple, Belton, Little River, Rogers, Buckholts, Cameron, Rockdale, Holland, Bartlett, Granger, Taylor, Hutto, Georgetown and Round Rock.

This project represents the first important construction undertaken by the Lone Star in five years; construction began October 12, 1934, and laying of the line on October 17, the line being completed shortly before the end of the year.

Two crews were employed on the line, one working from the east and the other from the west end. The longest haul of pipe was a 52-mile turn-a-round. Seventeen trucks and trailers were used.

All but 7½ miles of the line was salvaged from the Lone Star's system in southern Oklahoma and Texas. A cutting torch using Stargas was employed to assure a true edge on the reconditioned pipe. The line is electrically welded.

Several hundred overbends and sags were required and these were made cold, tractors equipped with brooms and winches being used for the purpose.

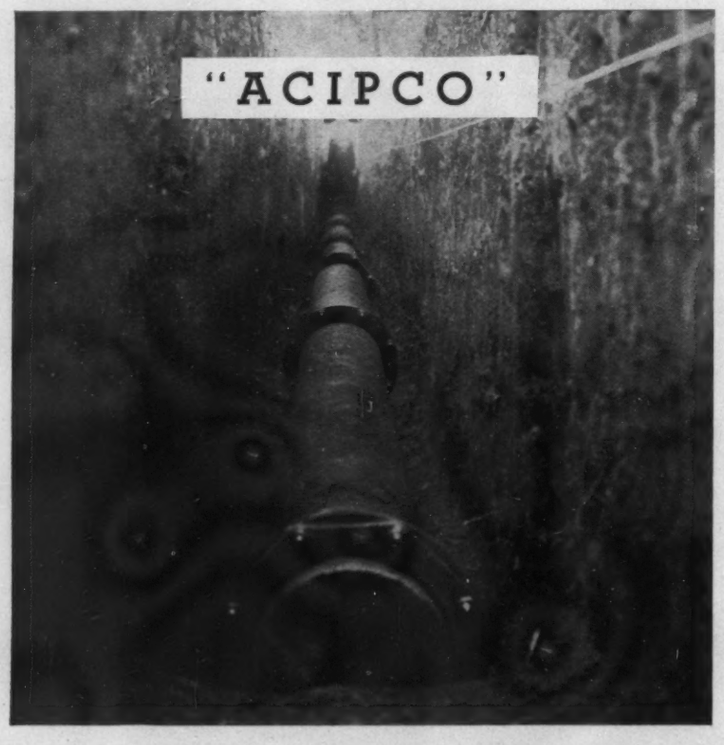
Heavy type ditchers were used in digging the trench which was 24 inches wide and 34 inches deep. About 1,000 feet of rock was encountered, the remainder of the soil being soft.

The line crosses the Trinity and the Navasota Rivers, the most difficult crossing being that of the Trinity River which is 100 feet wide at the point of crossing. Blasting was required for this river trench.

The line was tested thoroughly for pin-hole leaks at the welds. It was blown to remove construction debris and to purge it of air. Pressure was built up with gas from the wells and all leaks found were repaired and the final test was for twenty-four hours closed in with 450 pounds. The line was bottle tight at this pressure and was then put into regular use.

No additional compressor stations are required on this line, the wells having a rock pressure of 2,250 pounds. The wells are equipped with bottom hold chokes. Gas is going into the line at about 350 pounds pressure. The Lone Star has contracted with Tide Water Oil Co. and the Texas Seaboard Oil for 30 million cubic feet daily from five wells.

Ditching for Lone Star's 12-inch, 70-mile line from Long Lake field, now in service.




**10-inch Mono-Cast Doublex Simplex cast iron pipe line installed for gas transmission in Kansas, replacing a pipe line of substitute material that failed. When the regulating station is by-passed in emergencies, the Double Simplex line will operate at 200 pounds pressure. For literature on this pipe write American Cast Iron Pipe Co., Birmingham, Ala.**

## Peak Heating Rates Reduced for P. G. and E. Customers

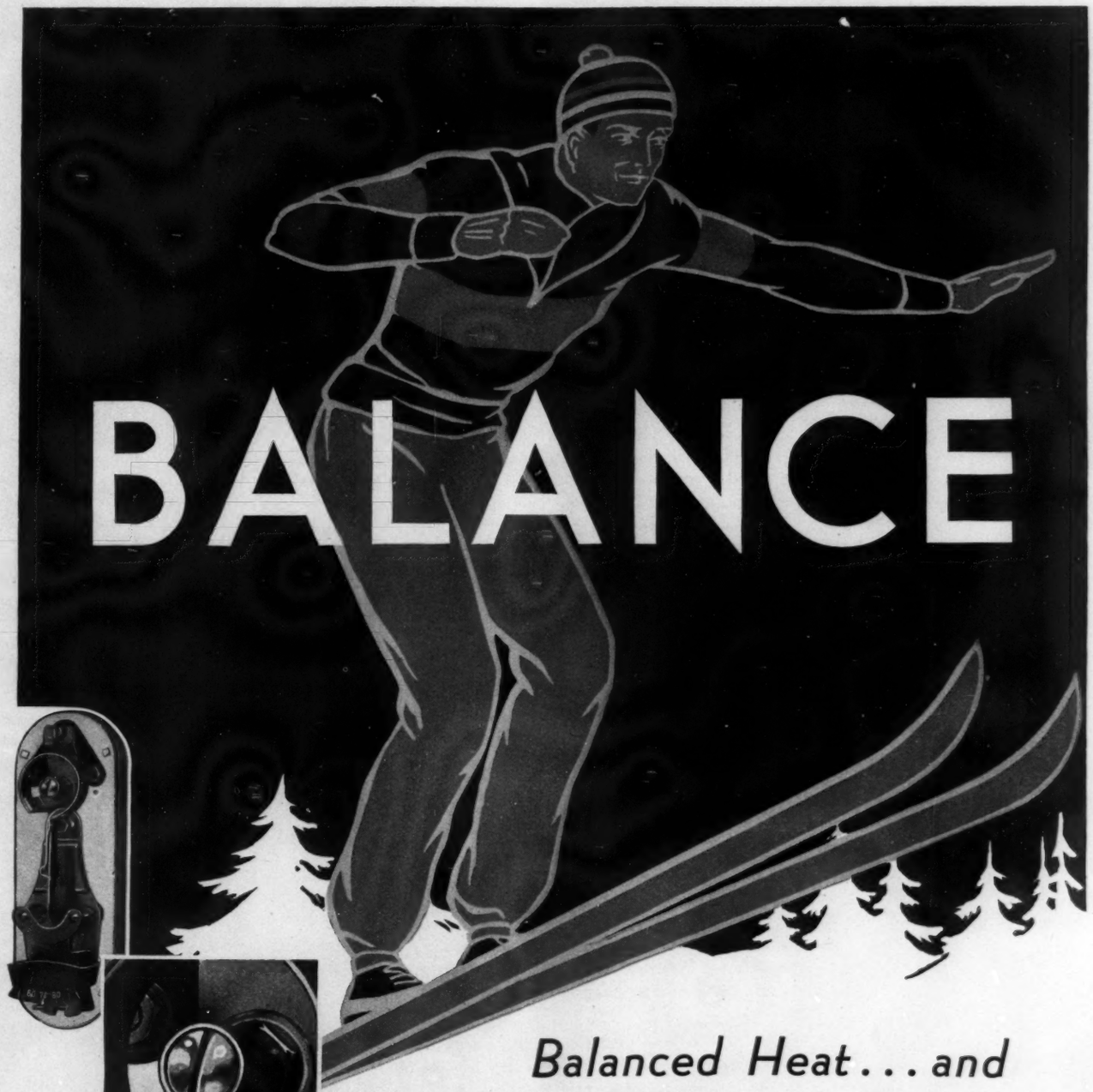
A new quantity domestic rate, applied to peak heating bills, was made effective by the Pacific Gas and Electric Co. on December 1, 1934, making available considerably more attractive rates for domestic gas heating appliances of all sizes and types.

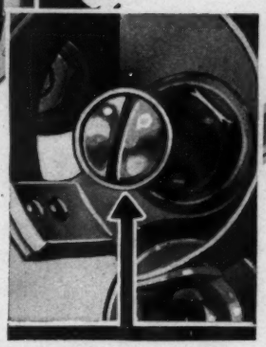
For example, in the San Francisco and East Bay Divisions of the company the commodity charge for all gas over 20,000 cu. ft. per meter per month is, under the new rate schedule, 3.5c per 100 cu. ft. This rate applies to all domestic gas consumption including cooking and water heating, whereas, before the new schedule went into effect, a similar quantity rate applied only to central heating plants with a B.t.u. rating of 200,000 or over.

The new schedule was designed specifically to provide a more attractive rate for such heating appliances as floor furnaces, radiant type heaters, circulators, etc. It has been placed between the commercial heating and regular domestic rates.

## "Pan Laundry" Uses Gas

A new field for natural gas sales is seen in a recently established "pan laundry" in Los Angeles, Calif., which features a service of cleaning pans for bakeries and commercial cooking establishments. Natural gas burners under a large vat correctly heat a special solution which effectively cleans baking tins without disturbing the valuable "baking finish."



**Variable Compensator**

Governs burner operating when heat actually is being distributed. It assures proper balance and prevents waste by accelerating thermostatic action . . .

## *Balanced Heat . . . and Balanced Heat Distribution*

BALANCE! Vital to the ski rider — and just as vital to gas heat . . . The new Minneapolis-Honeywell Heat Accelerating Thermostat balances the heat supply with heat losses and levels the effects of intermittent firing. It distributes heat uniformly, balancing the supply in remote sections with that near the thermostat . . . The Minneapolis Honeywell Heat Accelerating Thermostat enables users of gas heat to derive the greatest satisfaction and economy from their equipment. Minneapolis-Honeywell Regulator Co., 401 E. 28 St., Minneapolis, Minnesota. Branch and distributing offices in all principle cities.

**QUALITY CONTROLS COST LESS THAN SERVICE**

# MINNEAPOLIS-HONEYWELL

*Control Systems*

# RELIANCE REGULATORS

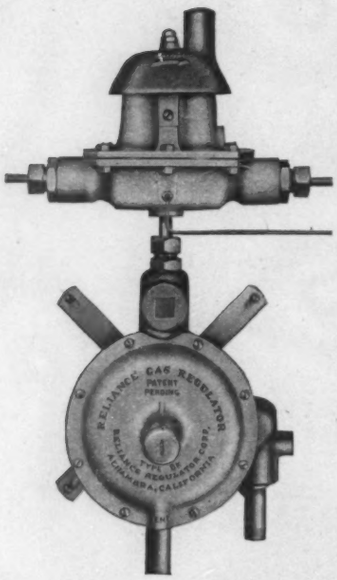
## THE ANSWER TO AUTOMATIC BOTTLED GAS CONTROL

When you specify Reliance for a liquid petroleum gas service, you are specifying regulators that have been thoroughly tested and approved in both laboratory and field operation. For butane, propane and mixed gas control, Reliance Duplex Operating Type Regulators give maximum satisfaction.

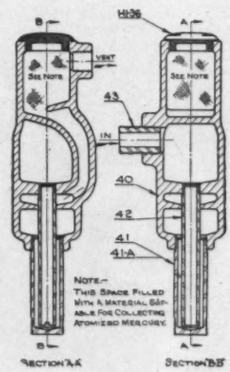
One of the most popular installations is the "MR" Primary Regulator used in conjunction with either a Type "B" or "BK" Secondary Regulator. The Primary "MR" Regulator reduces extremely high pressures encountered in the service cylinder when first installed, to an intermediate pressure of from 3 to 10 lbs. The "B" or "BK" Regulator then reduces this pressure to a uniform outlet pressure required for proper and uninterrupted appliance utilization.

Reliance Type "B" and "BK" Regulators are separate units that can be used individually as single step reducing regulators with the use of manual control valves. These regulators are equipped with brass inlet valves, composition valve seat discs and diaphragm, insuring long life, sensitive regulation and immunity to temperature conditions. Both regulators have detachable valve seats and may be readily inspected or changed.

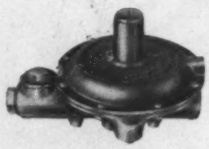
A proven and positive pressure safety relief device is used on these regulators. It is the Reliance standard type mercury seal, superior to either weight-loaded or diaphragm type. The collector type mercury seal practically eliminates all possibility of mercury loss and can re-seal after a momentary blow. Internal mechanical relief valves can be furnished where required. Detailed illustrated bulletin and prices will be furnished promptly.




*Above is illustrated the Type "MR" spring-loaded Primary Regulator—with a Type "BK" Secondary Regulator. The "BK" is equipped with brackets and mercury seal.*




*Cut-away section of the special collector type mercury seal. Will re-seal after a momentary blow.*



*Side view of Reliance Type "BK" Regulator, which may be used either as a single step reducing regulator or as a secondary installation.*

RELIANCE REGULATOR CORPORATION 1000 Meridian Ave. Alhambra, California

REGULATORS YOU CAN RELY ON — RELIANCE — SINCE 1910 — TRADE MARK

**RELIANCE REGULATORS**

# BUTANE-PROPANE NEWS

## Spokane Bus System Converting To Butane-Propane Fuel

*By* HENRY N. WADE

*Parkhill-Wade, Inc., Los Angeles, California*

AFTER a survey of the various applications of butane-propane fuels for automotive power in Southern California, the management of the Spokane United Railways decided early last fall to proceed with a large-scale application on the bus system in Spokane, Wash. Arrangements were made to secure a supply of fuel from the Cut Bank absorption plant of the Montana Power Gas Co.; construction of the liquid-gas unit at Cut Bank and of the storage, dispensing and conversion equipment at Spokane, was started about the first of last November. This work was completed before January 1, and the first butane-fueled bus at Spokane went into service January 6. Ten 30-passenger Fargo "95" buses are now in regular schedule service. Conversions of one each of five other types of buses are now under way, and, in view of the highly satisfactory operating results already attained, it is expected that the entire fleet of about 70 buses will be converted within the next few months.

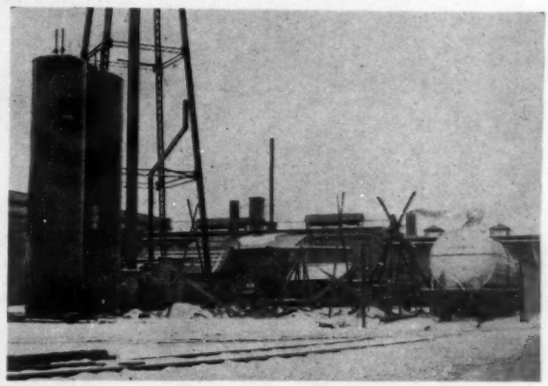
The entire installation at Spokane, including the conversion equipment on the buses, was designed and constructed in accordance with the California Industrial Accident Commission "Liquefied Petroleum Gases Safety Orders."

The butane storage at Spokane consists of two vertical tanks each 8 feet in diameter by about 38 feet high overall. Each tank has a net liquid capacity of 12,500 gallons. They are designed for a maximum working pressure of 110 lbs. per sq. in. gauge. Each tank is fitted with safety valves at the top, of adequate capacity for full overpressure protection. A high-pressure fully enclosed level gauge of the float-and-tape type is fitted on each tank; this device permits reading the liquid depth from ground level, without the use of gauge glasses.

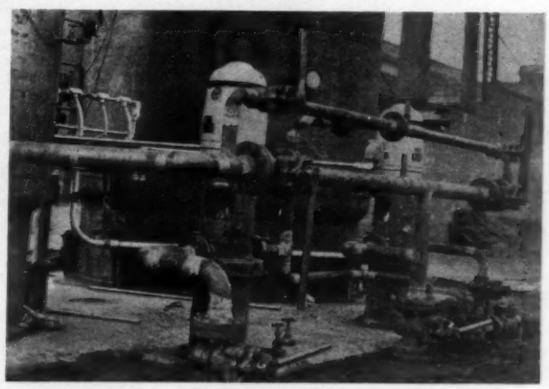
Two pumps are provided for handling the liquid gas; these pumps are vertical four-stage centrifugals, driven by explosion-proof motors. A rather elaborate header system is arranged so that either pump may be used for delivering butane from storage to the bus fueling stand, or for unloading butane from tank cars to storage, or for transferring from either tank into the other. The electric control system is designed so that one pump is automatically started and stopped by means of a hook-switch on which the fueling hose hangs at the fueling stand, while the other can be controlled by push-buttons for simultaneously unloading a car. A control change-over switch is provided so that these duties can be interchanged between the two pump units.

At the bus fueling stand the liquid discharged from the fueling pump first passes through an automatic vapor trap to insure that no vapors will be metered into the buses, then through a fine strainer into a meter of the positive-displacement type. The liquid from the discharge side of the meter next passes through a differential pressure governor valve, set to maintain a pressure on the meter at all times in excess of the vapor pressure of the liquid, and thus prevent false meter readings due to vaporization in the meter. The liquid then passes through a hand-operated self-closing control valve into the fueling hose which is used for making the connection to the bus fuel tanks. Fueling rates of 15 gallons per minute are easily attained with this arrangement; the entire operation of connecting up to a bus, filling 50 gallons of fuel, and disconnecting and releasing the bus requires only 4 minutes.

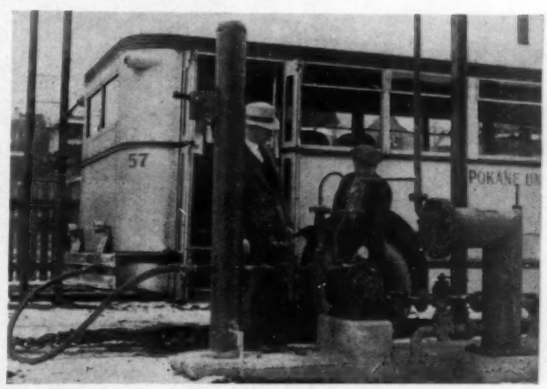
A novel design of fuel tank and filling connection permits filling with a single hose conveying liquid only; no vapor return connection is required, nor is it necessary to bleed vapor to determine the liquid level in the fuel tank. The outage volume required by the Safety Orders to accommodate liquid expansion due to temperature changes in a filled tank is provided in a small auxiliary tank, either inside or outside the main fuel tank. This outage tank is isolated from the main tank automatically by the application of the filling-hose fitting to the fuel tank filling connection, and is automatically reconnected to the main tank when the fitting is removed. This arrangement greatly facilitates the fueling operation; the overall time for filling say 50 gallons is actually less than is possible with conventional gasoline pump outfits.



General view of installation at Spokane. Left to right: Storage tanks, fueling stand, butane tank car being unloaded.



Base of storage tanks, showing pump sets and header system.




Fueling a bus—left to right: Filling hose, hose post with hook-switch, self-closing control valve, differential governor, meter, strainer and vapor trap.

It was anticipated that during extremely cold weather the liquid gas in the fuel tanks might not have sufficient vapor pressure to deliver fuel to the engines, and tentative provisions were made for artificially heating the tanks. So far such heating has proved to be unnecessary, in spite of the fact that during the week-end of January 19 outside temperatures of 20° F. below zero were experienced.

It appears that warm air swept back under the body from the engine keeps the fuel tanks 10 to 20 degrees warmer than the surrounding air.

The first 10 buses are equipped with special engine heads giving a compression ratio of 6.5:1; otherwise no modifications have been made in the engines. Twin fuel tanks, made into a single rigid unit, are mounted under the bodies back of the rear axle; the fuel capacity is 58 gallons. Standard butane carburation sets are used, employing a jacket-water heat exchanger for vaporizing and two stages of pressure reduction between the fuel tanks and the venturi mixing tube.

The entire installation at Spokane, including the bus conversions, was designed and furnished by Parkhill-Wade, Inc. of Los Angeles. The liquid-gas manufacturing unit at the Cut Bank plant was constructed by The Stearns-Roger Mfg. Co. of Denver, under the engineering supervision of Parkhill-Wade, Inc.

# H. Emerson Thomas Elected President of N. B. G. A.

H. EMERSON THOMAS, of the Philgas Department of Phillips Petroleum Co., was elected president of the National Bottled Gas Association at its annual meeting held January 23 at the Lexington Hotel in New York City. He succeeds Mark Anton, of Suburban Gas Co., Verona, N. J., who had been president since the founding of the Association three years ago.

*H. Emerson Thomas*

Edward Brain, of Brain & Gouchee, Hawthorne, N. J., was reelected first vice-president and B. D. Geroy, of the Illinois Bottled Gas Co., Chicago, Ill., was elected second vice-president. Frank H. Fetherston was reelected secretary and treasurer.

The following were selected by the Association as directors:

Mark Anton, Suburban Gas Co., Verona, N. J.; Edward Brain, Brain & Gouchee, Hawthorne, N. J.; B. D. Geroy, Illinois Bottled Gas Co., Chicago, Ill.; Paul Zook, Sloan & Zook, Kane, Pa.; Dr. R. W. Miller, Hope Construction & Refining Co., Pittsburgh, Pa.; Fred Warner, Superfuel Co., Tampa, Fla.; H. Emerson Thomas, Phillips Petroleum Co., New York, N. Y.; Plumer Pope, Fuelite Natural Gas Corp., Waltham, Mass.; J. E. Balsley, Standard Oil Co. of Calif., San Francisco, Calif.; William H. Thompkins, William H. Thompkins, Inc., East Williston, R. I.; Walter Verkamp, Verkamp Corp., Cincinnati, O.; A. N. Kerr, Imperial Gas Co., Los Angeles, Calif.; Carl Schmidt, Nugas Service Co., Darien, Conn.; G. W. Bach, Skelgas Co., Kansas City, Mo.; Harry Strickler, Protane Corp., Erie, Pa.

The day's meeting, attended, despite inclement weather, by approximately 100 members of the industry, was given over largely to a discussion of taxation as it affects the bottled gas business, sales opportunities afforded by the National Housing Act, and plans for expansion of the Association.

The guest luncheon speaker was C. H. Burdette, Regional Director of the Federal Housing Administration, whose subject dealt with the increased market for bottled gas installations made possible through government-guaranteed loans for new houses and rehabilitation of houses now existing.

E. M. Borger, of Hope Construction & Refining Co., presented a paper on the Federal and State Tax Laws which apply to bottled gas, giving interpretations of their phraseology and the terms under which bottled gas is exempt from the tax imposed on petroleum products by the Revenue Act of 1934.

F. L. Fairchild, of Sprague Meter Co., spoke on the value of the meter, particularly as regards customer psychology, in the measurement of bottled gas consumption.

H. E. Newell, of the National Board of Fire Underwriters, discussed the importance of observing safety provisions. He stated that the insurance companies cannot police the industry and that the prevention of onerous restrictions on installations, or even the invalidation of insurance policies, depends upon the willingness of operating companies to comply with safety requirements.

A recapitulation of methods necessary to successful sales promotion, prepared by the program committee, was read by Harry Strickler, of the Protane Corp.

At the afternoon business session a review of the progress of the Association was given by Mark Anton, the outgoing president, and a discussion was held on the advisability of establishing an auxiliary association of bottled gas dealers in the Middle Western states.

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## Southern Oregon Properties Being Converted to Butane-Air Service

PROPERTIES of the Southern Oregon Gas Corp., now serving oil-gas at Ashland, Phoenix, Talent, Medford, Grants Pass and Roseburg, Ore., are being converted to butane-air service, according to announcement by the Republic Management Co., Ltd., San Francisco, which is operating the system. Conversion to the new service will be made through the use of "Gasairs" and "Gasair" vaporizers, manufactured by the Utility Development Co. of San Francisco.

Medford, Ore., will be served with four units located at four widely separated parts of the town. The units will be supplied with liquid butane through ¾-inch copper tubing from a central storage tank, and will make 850 to 900 B.t.u. gas directly into the distribution mains against approximately 2 pounds per square inch pressure.

Ashland will be served in the same manner as Medford, through two "Gasair" units. Gas will be made directly into the distribution mains at Phoenix and Talent against approximately 8-inch water column. At Grants Pass and Roseburg gas will be made into a lift holder for the present, but later will be converted to make directly into the mains.

Republic Management Co., Ltd. also operates the Needles (Calif.) Gas and Electric Co., where conversion from manufactured gas to butane-air service similar to that being installed in the Oregon properties was made in 1934.

## Compressed Gas Manufacturers Ass'n. Elects 1935 Officers and Board

The Compressed Gas Manufacturers' Association held its 22nd annual meeting January 21-22 at the Waldorf-Astoria Hotel in New York, N. Y. Charles L. Gulick was elected president, Dr. W. P. Heath, first vice-president, W. P. Uhler, second vice-president, and Frank H. Fetherston was re-elected secretary-treasurer. An executive board consisting of 28 members was also chosen.

## A.P.I.-A.S.M.E. Pressure Vessel Code Now Available

The Joint A.P.I.-A.S.M.E. Code for the design, construction, inspection, and repair of unfired pressure vessels for petroleum liquids and gases is now off the press and may be obtained from the American Petroleum Institute at $1 per copy. The code covers both welded and riveted vessels for operation at gauge pressures above 15 pounds per square inch and at temperatures not over 1,000 degrees F.

## First Canadian Production of Liquefied Gas Due Soon

Canada's first facilities for production of liquefied petroleum gas are nearly ready to go into operation. The refining department of the Imperial Oil Co., will shortly complete a unit at the Toronto refinery which will have a maximum capacity of 2,500 Imperial gallons of liquefied gas daily. The company does not plan to engage in retail marketing, but will supply tank car orders and also charge cylinders for local distributors.

## Committee Attends Washington Hearings on Code Revises

W. F. Verkamp, chairman of the Liquefied Gas Industry Emergency National Committee, late in January appointed a committee of four to attend a hearing at Washington scheduled for January 28, on amendments to the industry's code proposed by the National Recovery Administration. On the committee were R. W. Thomas, Howard Bunn, C. L. Kerr, and R. W. Miller.

## Bureau of Explosives Work Now Under Assn. of American Railroads

The American Railway Association and the Association of Railway Executives have been united in one organization known as the Association of American Railroads. The Bureau of Explosives will function as a Bureau of the Operations and Maintenance Department of the new organization.

## Bottled Gas Distributor Passes

Frank H. Pope, manager and treasurer of Fuelite Natural Gas Corp., distributors of bottled gas in New England, died December 22, 1934, after an extended illness. His brother, P. E. Pope, is now acting manager of the company.

### Bottled Gas Installation Charges Reduced In Cincinnati Territory

Shellane department of Shell Petroleum Co., St. Louis, Mo., recently posted with the liquefied gas industry Code Authority a declaration of intention to reduce the installation charge on bottled gas outfits in the Cincinnati, Ohio, territory from $36.50 to $15.00. A rebate of the installation charge will be made to those who discontinue service within a three-year period, less $3.00 for each year of use.

### Fairweather and Wallace in Natural Gas Corp. Transfers

F. R. Fairweather, manager for the Natural Gas Corp. of California at Calexico since December, 1933, has been put in charge of the Rio Vista and Isleton offices of the company. P. L. Wallace, formerly of the El Centro office, will succeed Mr. Fairweather at Calexico.

### Wisconsin Rapids Gas Co. to Serve Nekoosa

Nekoosa, Wis., has granted the Wisconsin Rapids Gas Co. a franchise permitting the installation of a distribution system for liquefied petroleum gas service, construction of which is scheduled to start in the early spring, according to Lee Barker, president of the company.

### Consumers Gas Co. Gets Franchise

The city commission of Bend, Ore., has awarded the Consumers Gas Co. a 20-year franchise for the service of butane-air gas. The company purchased the Bend gas property from the Natural Gas Corp. of Oregon in the spring of 1934, and application for franchise has been under consideration since that time.

### Philgas Superintendents Transferred

Philgas Department of Phillips Petroleum Co., Detroit, Mich., announces the transfer of the following district superintendents of operations: S. B. Upham to Hudson, Ohio; E. G. Howick to Haskell, N. J.; C. E. DeLaney to Richfield Springs, N. Y.; P. K. Miller to Windsor, Conn.

### Andalusia Starts Plant Construction

According to J. G. Scherf, mayor of Andalusia, Ala., construction was scheduled to start February 1 on the municipal butane-air generating plant and distribution system. A P.W.A. loan of $67,700 was recently granted the city.

### George Verkamp Dies

George Verkamp, member of Verkamp Corp., distributors of bottled gas in the Cincinnati, Ohio, vicinity, died December 15, 1934. The business will be continued by his brothers, Walter and Richard.

### American Liquid Gas Changes Address

Effective February 1 the address of the American Liquid Gas Corp. will be changed from 1225 South Olive Street, Los Angeles, Calif., to 811 West 7th Street Building, Room 404.


TWICE AS MANY IN SERVICE

**Twice as many Hackney Liquefied Petroleum Gas Cylinders in service as all others combined. Or, put it another way—every time a Liquefied Petroleum Gas Cylinder is used—two to one it will be a Hackney cylinder.**

**Domination of this market has been won by the superior design and construction of Hackney Liquefied Petroleum Gas Cylinders—which were built by Hackney from the first development of these products.**

PRESSED STEEL TANK COMPANY

208 S. La Salle St. Bldg., Room 1185, Chicago, Ill.
1363 Vanderbilt Concourse Bldg., New York, N. Y.
6633 Greenfield Ave., Milwaukee, Wis.
666 Roosevelt Bldg., Los Angeles, Calif.

Hackney MILWAUKEE

CONTAINERS FOR GASES, LIQUIDS AND SOLIDS

VERSATILE

In addition to its regular functions of mixing butane and air automatically, supplying economical town service and providing inexpensive repair or change-over units, the "GASAIR" BUTANE MIXER is inherently useful as:

**OIL-FOGGER • HUMIDIFIER • ODORIZER**

Write for detailed information and prices.

"GASAIR" Butane Mixer

Utility Development Co. (John K. Heller, President)
**5815 Third Street, San Francisco**

# Critical Flow Orifices

*By* R. M. STEWART

*Pacific Gas and Electric Company**

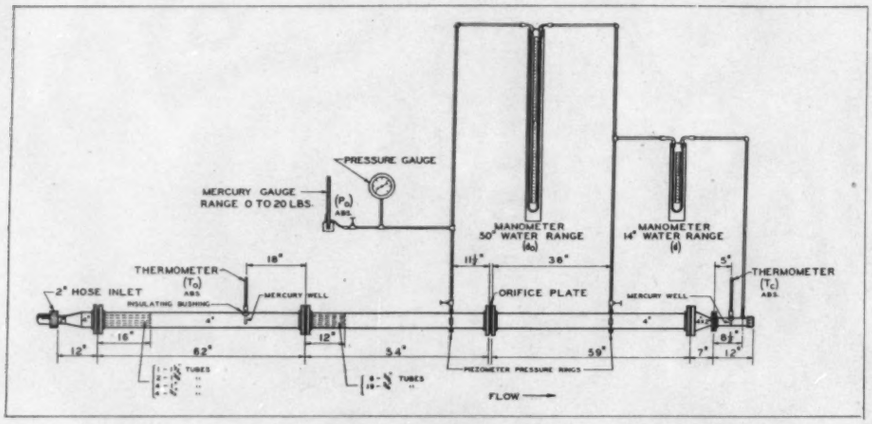


FIG. 1. Critical flow orifice testing apparatus.

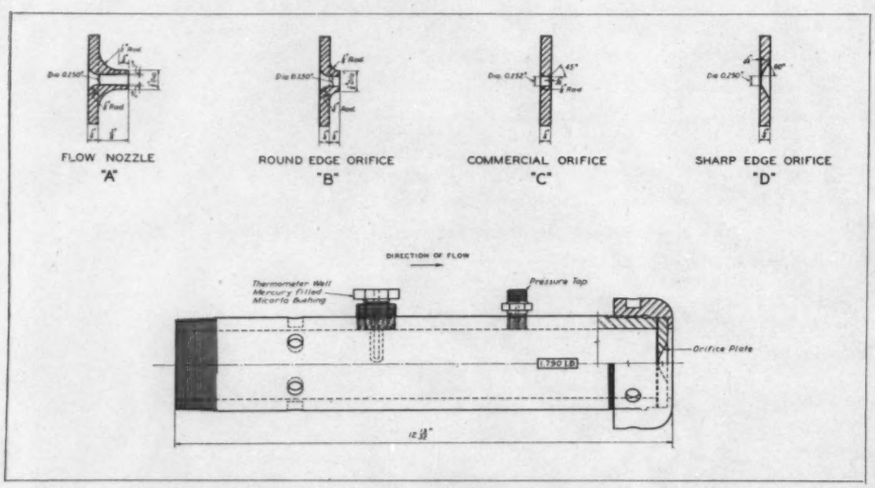


FIG. 2. Critical flow orifice meter prover.

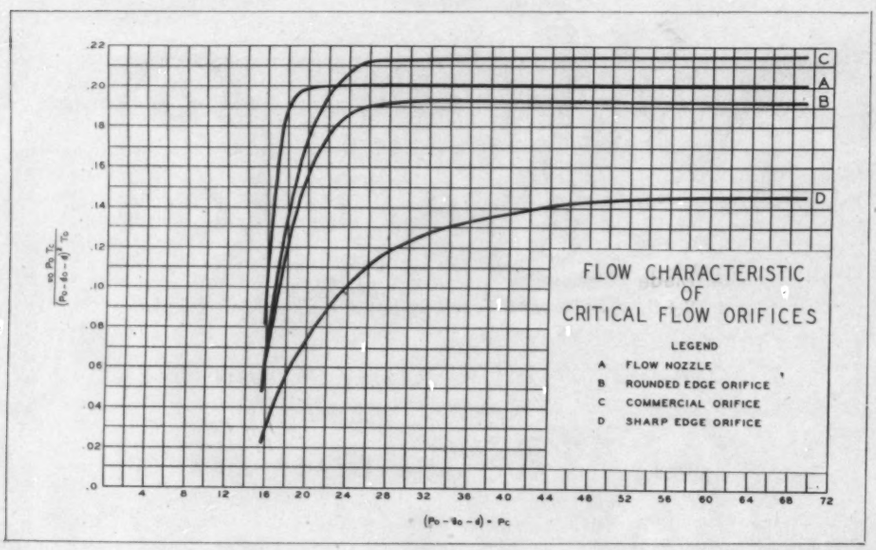
FLOW CHARACTERISTIC OF CRITICAL FLOW ORIFICES
LEGEND
A FLOW NOZZLE
B ROUNDED EDGE ORIFICE
C COMMERCIAL ORIFICE
D SHARP EDGE ORIFICE
(Po - ΔPo - d) ÷ Pc

FIG. 3.

SEVERAL investigators have worked with small orifices using air as a medium and their results led to the belief that the shape of an orifice had a decided effect as to when critical flow would take place. With this in mind the following experiment was conducted:

An orifice meter was hooked up in tandem with a critical flow orifice prover as shown in Fig. 1. Gas was passed through this hook-up at pressures ranging from 1 to 55 pounds gauge. The static pressure ($P_o$), differential ($d_o$), and temperature ($T_o$) were noted for the orifice meter, while the temperature ($T_c$) and the differential pressure (d) were noted for the critical flow prover. The experiment was repeated with each of the four types of critical flow orifices. (See Fig. 2.)

The orifice meter tubes were specially selected for uniform size and smoothness. The disc used was a standard orifice plate with a perfect 90° sharp edge on the upstream side. The ratio of the orifice to the tube was .182.

Full flow connections were used, but instead of the conventional pressure taps piezometer rings were used. The differential across the orifice was read on a 50-inch water U-gauge. The static pressure up to 20 pounds was taken with a mercury U-gauge, and above 20 pounds with a calibrated needle gauge. Temperatures were taken with calorimeter thermometers reading to one-tenth of a degree F.

The critical flow prover was designed with particular attention given to avoid any interference with the discharging gas stream.

Flow through an orifice meter varies directly as the square root of both the differential ($d_o$) and the absolute pressure ($P_o$), while the flow through an orifice at critical flow varies directly as the absolute pressure ($P_c$).

Disregarding specific gravity in both cases, the flow through the orifice meter is

$$Q = K_o A_o C_o \sqrt{d_o} \sqrt{P_o} \sqrt{1/T_o} \qquad (1)$$

and through an orifice at critical flow

$$Q = K_c A_c C_c P_c \sqrt{1/T_c} \qquad (2)$$

*Presented before Pacific Coast Gas Association 1934 annual convention.

Where K, A, and C respectively equal the numerical constant, area of the orifice, and coefficient of discharge for the particular gas under consideration.

By continuity

$$K_o A_o C_o \sqrt{d_o P_o} \sqrt{1/T_o} = K_c A_c C_c P_c \sqrt{1/T_c}$$

and since $K_o A_o C_o \div K_c A_c C_c$ remains a constant, likewise

$$\frac{d_o P_o T_c}{P_c^2 T_o} \quad (3)$$

should remain constant so long as critical flow is maintained.

Since $P_c = P_o - d_o - d$

(3) becomes

$$\frac{d_o P_o T_c}{(P_o - d_o - d)^2 T_o} \quad (4)$$

which was plotted against $(P_o - d_o - d) = P_c$

When this ratio (4) ceases to remain constant it is indicative that critical flow no longer exists. From the curves in Fig. 3 it is noted that orifice "D" (sharp edge) had not entirely flattened out at 50 pounds gauge, while curve "A" (flow nozzle) had apparently reached critical flow at somewhere between 12 and 15 pounds. Curves "B" and "C" seem to reach critical flow at about 25 pounds. From these curves we must come to the conclusion that the flow nozzle is the only one of the four which will check the generally accepted formula as given in most handbooks, to determine when critical flow takes place. It also appears as though the flow nozzle as shown in Fig. 2, or some modification of it, would be the most acceptable shape of orifice for test work.

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### Bristol Introduces New Recording Absolute Pressure Gauge

A new direct reading absolute pressure gauge of the recording type has been developed by The Bristol Co. The instrument is a recording vacuum gauge which is compensated for changes in barometric pressure and for changes in temperature.

The Bristol recording absolute pressure gauge is equipped with two measuring elements which are coordinated through a special differential transmitting linkage. One measuring element is connected to the vacuum line and the other functions in connection with the compensating features of the recorder. The instrument can be furnished for ranges as low as 25 millimeters head of mercury absolute pressure or its equivalent. It is made in rectangular form case of wall type or flush type design.

Further information on the product may be obtained by addressing the company at Waterbury, Conn.

### Shaw Publicity Manager for U. S. Pipe; Linderman to Washington

On January 1 Ralph M. Shaw, Jr., was appointed publicity manager for the United States Pipe and Foundry Co., with headquarters at Burlington, N. J., succeeding S. E. Linderman, who has been made representative in charge of the company's Washington office.

## Gain in Southern Counties Sales Told at Annual Dinner

SOUTHERN Counties Gas Co., Los Angeles, held its annual sales dinner meeting on January 17, with a large group present, including numerous out-of-town guests and several company executives. Clyde H. Potter, commercial manager for the company, presided as toastmaster. Mr. Potter announced that the company's net appliance sales for 1934 aggregated $500,000. Supplementing this total, net dealer sales closed by Southern Counties salesmen for dealers reached $263,000, a total of $763,000 for the year's sales activities. Conditions are noticeably better in every appliance line, according to Mr. Potter, and expectations are for substantial increases in 1934 totals.

Present at the meeting were F. S. Wade, president, N. R. McKee and M. R. Thompson, vice-presidents, and W. J. McCoy, comptroller of the company. Mr. Wade and Mr. McKee both addressed the meeting, as did also W. G. Rich, Whittier manager for the company. The speaker of the evening was Frank Plane of the Adventurers Club.

Out-of-town guests included E. E. Sellman, New York, and H. A. Strong, Oakland, vice-president in charge of sales, and executive vice-president, respectively, for Servel, Inc.; E. D. Millikan, San Francisco, Pacific Coast manager for the American Stove Co., C. B. Babcock, San Francisco, president of the C. B. Babcock Co., and Clifford Johnstone, San Francisco, managing director of the Pacific Coast Gas Association.

Award was made at the meeting of a 52-piece silver set to Nobel King, commercial agent at Whittier. This award made by Servel, Inc., was for the greatest percentage sale on a meter basis of Electrolux refrigerators, between November 15 and December 31. Leather wallets also offered by Servel went to many of the company's salesmen for selling five or more refrigerators during the same period.

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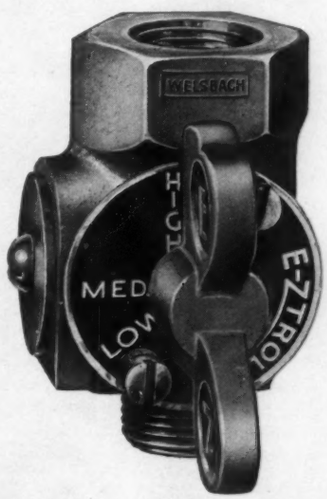
### Welsbach Co. Develops E-Z Trol Valve

The Welsbach Co. laboratories have developed an E-Z Trol valve for customer control of gas supply to gas storage water heaters. The function of this valve is the




optional changing of burner capacity and corresponding hot water quantities. By turning the handle to any one of three different positions the capacity can be made that which is normal to the burner, intermediate, or low, the last two being predetermined.

### Roberts-Gordon Made National "Air Package" Distributors

The Roberts-Gordon Appliance Corp., makers of conversion burners, have been appointed exclusive national distributors for the "Air Package," an air-conditioning unit made by Air Controls, Inc., of Cleveland, a subsidiary of The Cleveland Heater Co. This arrangement applies to the utilities field only.

Roberts-Gordon Appliance Corp. is marketing its burner and the "Air Package" under the name of the Roberts-Gordon Air-Package Combination.

### American Meter Co. Announces Bulletins in New Size

AMERICAN METER CO. has announced release of a new catalogue and instruction bulletin on the Metric Indicating Flowmeter. This bulletin is attractively printed and fully illustrated with diagrams for various types of installations. It is published in the new 8½- x 11-inch size for adaptation to the company's loose-leaf binder which has been recently introduced. The number is E-3.

To date the following additional new bulletins have been printed in this size:

AG-1. Meter Proving and Testing Apparatus; Cubic Foot Standards.

AG-3. Wet and Dry Test Meters; Demonstration Meters.

AG-4. Demand Meters—Recording, Indicating.

AG-6. Service Cleaners.

E-15. Metric Wide Range Orifice; Needle Valves and Fittings.

E-21. Recording Gravitometer.

EG-40. Ironcase Meters.

E-5. Rate-Volume and Liquid Level Controllers.

E-12. Base Pressures and Base Volume Indexes.

The three latter bulletins were published in January. In the process of revision and standardization, the American Meter Co. will have all its literature in the new size with the exception of Handbook E-4 on Displacement Measurement and Handbook E-2 on Orifice Measurement. The latter publications are purely educational, being adapted mainly for reference work and study in engineering offices and libraries.

### Pecos Valley Gas Co. Completes 26-Mile Pipe Line

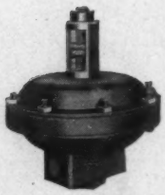
Pecos Valley Gas Co., Artesia, N. M., has recently completed a 6-inch natural gas pipe line which extends from its main line near Carlsbad, N. M., and connects with the Jal-El Paso pipe line 26 miles southeast. The extension will make available an emergency supply of 6,000,000 cubic feet of gas daily from the Jal field.

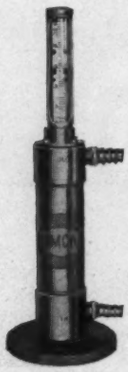
## Pittsburgh Equitable Meter Has Safety-Seal Regulator; Flow Indicating Meter

THE Pittsburgh Equitable Meter Co. has developed two products of interest to gas men who are merchandising the Servel Electrolux refrigerators, the Emco Safety-Seal pressure regulator and the Emco flow indicating meter.

The Emco Safety-Seal pressure regulator is a small compact gas pressure regulator for gas refrigerator installations where it is impossible to run vent lines to the open air. Two diaphragms are incorporated in its design. In the event of control diaphragm failure or seepage through the control diaphragm, the gas flow is automatically cut off through the medium of the second diaphragm. This regulator, in addition to the safety feature, gives very accurate pressure control and is subject to simple and easy adjustment.

The Emco flow indicating meter provides an accurate instantaneous reading of small rates of flow in cubic feet per hour, and is useful in setting Servel Electrolux refrigerators, adjusting pilot lights, studying leakage, etc.





ABOVE: Emco Safety-Seal pressure regulator.

AT RIGHT: Emco flow indicating meter.

Bulletins describing these two appliances in detail and giving prices may be had by writing the Pittsburgh Equitable Meter Co., Pittsburgh, Pa.

## Arkansas-Louisiana Gas Co. Formed in Cities Service Subsidiary Merger

CITIES SERVICE CO., New York, N. Y., has consolidated the Arkansas-Louisiana Pipe Line Co., Southern Cities Distributing Co., Public Utilities Corp. of Arkansas, and Reserve Natural Gas Co. of Louisiana, four of its subsidiaries operating in Arkansas, under the name of the Arkansas-Louisiana Gas Co., with headquarters in Shreveport, La.

Consolidation was effected by merging three companies with the Southern Cities Distributing Co. and changing the name of the latter to Arkansas-Louisiana Gas Co. Stock of the new corporation was exchanged for outstanding stock of the discontinued companies and all real estate, equipment and other holdings of the four companies were transferred to the Arkansas-Louisiana Gas Co. The new company has been authorized to issue 240,000 shares of stock with a par value of $50 each under a Delaware charter.

The Southern Cities Distributing Co. served cities in northern Louisiana and eastern Texas; Public Utilities Corp. of Arkansas distributed natural gas in Arkansas; and the Reserve Natural Gas Co. and the Arkansas-Louisiana Pipe Line Co. operated exclusively as pipe line companies.

## S. C. M. A. Pyrometry Discussion Group Now Meeting

SOUTHERN California Meter Association's pyrometry discussion group got under way with its first meeting on January 8, at the Los Angeles offices of The Foxboro Co. D. M. Hill, district manager for Foxboro, opened the meeting and then yielded the gavel to R. M. Angell, who acted as chairman of the meeting.

The first meeting was given over to discussion of the general subject of pyrometry and an outline of suggested programs for future sessions. A second meeting was arranged for February 5, at the Los Angeles office of Leeds & Northrup, with P. W. Hill of the General Petroleum Corp. to serve as chairman. H. R. Abbey, Los Angeles manager for Leeds & Northrup, will address the group on "Elements of Pyrometry and Some of Its Applications", and a general discussion will be conducted on the checking, repair, and adjustment of pyrometric equipment.

A group of about 20 attended the first session, and interest is expected to continue at a high level. Anyone interested in the group may secure information on its activities by addressing the secretary of the Southern California Meter Association, Box 1100, Station C, Los Angeles.

## Community Public Service Co. Succeeds Texas-La. Power Co.

COMMUNITY Public Service Co. has been named by voting trustees as successor company of the Texas-Louisiana Power Co., Fort Worth, Texas, in accordance with a reorganization plan approved by the U. S. District Court for the Northern District of Texas, and the following temporary officers and board of directors selected:

Officers: R. L. Bowen, vice-president; Bennett L. Smith, secretary; Noel R. Parsons, treasurer; and W. Z. Leatherwood, assistant secretary and treasurer, all of Fort Worth. Board of Directors, which also comprised the voting trustees: C. H. Bencini, Fort Worth; Newton P. Frye, president Central Republic Co., Chicago, Ill.; and George Clifford, president, Stone & Webster Service Corp., New York, N. Y.

## California Natural Gasoline Ass'n Programs Feb. 7th Meeting

Latest methods in technical and engineering report writing as applied to petroleum operations will be reviewed by John F. Dodge, professor of petroleum engineering, University of Southern California, at the February 7th meeting of the California Natural Gasoline Association, in Los Angeles.

On the same program R. N. Donaldson, of the research and development department of the Standard Oil Co. of Calif., will describe "A New Plant Residue Test," developed for the rapid determination of the "pentanes plus" content of dry gas. The test is known as the butane absorption-weathering test.

## Portland Gas & Coke Inaugurates Direct Sales in Districts

The Portland (Ore.) Gas & Coke Co. has begun to merchandise gas appliances directly to customers in the territory outside of Portland, under a new plan of cooperative selling with dealers.

District offices in Vancouver, Hillsboro, Newberg, Salem, Corvallis and Albany, Ore., will sell appliances direct while the territory surrounding these communities will be served by local appliance dealers.

## Illinois Utilities Not Subject to Retail Sales Tax

The Illinois Supreme Court has ruled that public utilities dispensing gas, electricity, and water service in Illinois are not liable to the 2 per cent retail occupation tax imposed by the state legislature in 1933. The decision reversed an opinion of the Circuit Court of Cook County, Ill. Notice of request for rehearing has been filed with the clerk of the Supreme Court by the attorney general.

## Gas Service Co. Makes Personnel Transfers

CLAUDE GATES, assistant new business manager of The Gas Service Co. since 1931, has been made new business manager of the Danbury and Bethel Gas & Electric Light Co. of Danbury, Conn., Cities Service Power & Light Co. subsidiary.

Cy Young, industrial engineer of The Capital Gas and Electric Co. at Topeka, Kan., has been appointed by F. M. Rosenkrans, new business manager for The Gas Service Co. properties, to succeed Mr. Gates at Kansas City.

Chas. H. Koinm, chief engineer of The Gas Service Co., has announced the transfer of Joe Schubert, superintendent of The Wichita (Kan.) Gas Co., to the Ozark Distributing Co.'s Warrensburg, Mo., division as manager, succeeding Harold Johnston who will become superintendent of the St. Joseph (Mo.) Gas Co.

C. O. Carr, superintendent of the St. Joseph Gas Co. for the past five years, has been transferred to The Wichita Gas Co. to succeed Mr. Schubert.

## Herbert G. Day Establishes Insurance & Investment Firm

Herbert G. Day, son of Addison B. Day, president of the Los Angeles Gas and Electric Corp., and formerly with the American Meter Co., in January announced the establishment of a partnership firm under the name of Richey & Day. The firm, which will engage in general insurance and investments, is located at 720 Pacific Finance Building, 621 South Hope St., Los Angeles.

## Portland Cooking Schools Success

More than 50,000 persons attended the five gas cooking schools held in Portland, Ore., the latter part of 1934, under the auspices of The Oregonian, Oregon Journal, and the News Telegram, newspapers. Portland Gas & Coke Co. home service department participated in each school.

## 8th Meter Hi-Jinks

ATTENDANCE at the Southern California Meter Association's 8th Annual Hi-Jinks, held in the administration building of the central manufacturing district, Vernon, Calif., was another indication of the return to prosperity. Some 350 members and friends of the Association were on hand, the largest group to meet for the annual dinner and entertainment since pre-depression years.

In charge of arrangements for the highly successful affair were Chairman Frank Colton of the entertainment committee and a group of co-workers including George Christian, J. J. Delaney, George Forster, Gordon Greene, D. M. Hill, and J. A. Smith.

### Chaplin-Fulton Announces 1935 Edition of Company Catalogue

The Chaplin-Fulton Manufacturing Co., Pittsburgh, Pa., has just issued the 1935 edition of its catalogue listing and describing gas regulators, gas fuel supply and steam pressure control devices manufactured by the company. The latest edition has been increased in size and includes many charts and tables in addition to numerous illustrations.

Types of regulators covered include beside the more common forms of service for both natural and manufactured gas, special regulators for many uses in steam, water, oil and air service. The increased size of its present catalogue is due to the addition of certain toggled high-pressure regulators, relief valves, motor valves, and differential pressure regulators for mixing gases or gas and air, which were not included in former editions.

### Industrial Area Added to P. G. and E. System

Scheduled for completion early in February by the Pacific Gas and Electric Co. at a cost of approximately $30,000, a new 13,000-foot service line will serve the Port of Stockton industrial area. The new line, in sizes of 8, 6 and 4 inches, connects with the city of Stockton's 12- and 16-inch lines and extends to the industrial area on the outskirts of the city, which has not been previously served by gas.

Several industrial consumers, including the recently completed plant of the Morning Milk Co., will be served by the new extension.

### P.W.A. Allots First Fund for Survey of Gas Wells

The Federal Emergency Administration of Public Works, among other allotments to the United States, has set aside $500 for a survey of wells in the Quinton, Okla., gas pool to determine accurate locations and elevations. While the amount is small, the development is believed to be the first one of the sort under the P.W.A.

### Ill. Power & Light Staff Change

Wm. H. Matlack has been placed in charge of advertising and sales promotion for the Illinois Power & Light Co., at Champaign, Ill. He will direct all advertising and sales promotion work for the company's system.

**GENERAL COMMITTEE—1935 SOUTHWESTERN GAS MEASUREMENT SHORT COURSE.**
**Left to Right—Front Row**—R. D. Turner, G. B. Lane, W. R. McLaughlin, D. C. Williams, Prof. W. H. Carson, J. H. Satterwhite. **Middle Row**—E. E. Stovall, *R. W. Hendee, *Dean J. H. Felgar, L. G. Rheinberger, V. C. Jarboe, Eugene Metz, Gilbert Estill. **Back Row**—Max Watson, A. J. Kerr, J. J. Hassler, G. W. McCollough.

## 1935 Measurement Short Course, April 23-25

THE Southwestern Gas Measurement Short Course, held annually at the Engineering Building of the University of Oklahoma at Norman, Okla., will be held this year on April 23, 24 and 25. The dates were selected by the general committee in a meeting at Norman, January 21, and plans were made for the program for the 1935 course. University professors and representatives of manufacturers of gas measurement equipment conduct the short course each year for the benefit of members of the natural gas industry charged with responsibility of measurement of gas. Classes are open also to engineering students of the university who take advantage in large numbers of what the opportunity offers.

Registration at the 1934 course was 390 and was representative of 17 states and four foreign countries, the latter being Argentina, Belgium, England and Persia.

President W. B. Bizzell of the University of Oklahoma and J. H. Felgar, Dean of Engineering, give the course their enthusiastic endorsement and cooperation, while Professor W. H. Carson of the engineering faculty is active director of the course. The purpose of the project is to increase the accuracy of measurement and the efficiency of regulation for the better serving of the public, more accurate and equitable adjustment of purchase and sale of natural gas and the dissemination through the industry of correct information regarding the highly technical engineering problems involved.

The program for the 1935 course is being arranged by a committee under chairmanship of R. D. Turner of Tulsa. It will be announced in detail early in March. D. C. Williams of Ponca City is chairman of the general committee for 1935. The subcommittee chairmen are: W. H. Carson, Norman, banquet, entertainment and arrangements; G. W. McCollough, Bartlesville, exhibits; Ray Roundtree, Houston, Texas, study of practical methods; Max Watson, Amarillo, Texas, publications; and E. F. McKay, Oklahoma City, registration.

Other members of the 1935 general committee are: W. R. McLaughlin, Gilbert Estill, Ray E. Miller, W. F. Lowe, J. H. Satterwhite, G. B. Lane, B. L. Maulsby, and L. G. Rheinberger of Tulsa; E. E. Stovall, A. E. Higgins and D. A. Sillers of Dallas; G. P. Bunn, V. C. Jarboe and F. D. Franks of Bartlesville; Fay C. Walters of Kansas City, Mo.; E. A. Clark of Pittsburgh, Pa.; Earl Kightlinger of Shreveport, La.; John H. Baxter of Ashland, Ky.; C. B. Day of Blackwell; and B. P. Stockwell of Oklahoma City.

*Not member of committee.

### 12-Inch Pipe Line Scheduled in Wichita Falls Gas Co. Program

Construction of a 12-inch pipe line from Palo Pinto County, Texas, to the city late in January, according to T. J. Hutcherson, manager of the company. The Palo Pinto gas will be blended with the company's principal supply of natural gas which is to come from the Panhandle area.

The Wichita Falls (Texas) Gas Co. recently completed a distribution system for the service of natural gas in Wichita Falls.

### Milwaukee Shop Supervisor Passes

William Beerman, shop supervisor of the Milwaukee Gas Light Co., passed away on January 21. He had been in the employ of the company for 49 years, having joined the organization when there were only five employees in the service department.

### Hale Sales Manager at Henderson

O. G. Hale, formerly of the Huntsville, Texas, district of The United Gas Public Service Co., has been made sales manager for the company at Henderson, Texas.

# *Here's 1935 Advertising Schedule*

256 ROOMS
greet guests with warmth and comfort
CHIEF ENGINEER GEORGE W. JOHNSON of the Alexander Hamilton, has nothing but praise for the cleanliness, convenience and economy of Gas, the Modern Fuel.
"Since we changed to gas," he says, "we have made a substantial saving in fuel costs. The boiler tubes have remained cleaner, and the operation of our heating plant has been simplified. Greater operating convenience is an important advantage of gas fuel, with automatic control."
Architects and Builders are invited to consult with Gas Company engineers. Your local Gas Company makes no charge for this advisory service.
ALEXANDER HAMILTON HOTEL
SAN FRANCISCO
Owned and operated by Allied Properties
Two gas-fired "upshot" burners, with automatic damper control, operate steam boilers at 5 lbs. pressure, supplying clean, uniform heat to this entire modern hotel building.
Gas
The modern fuel
PACIFIC COAST GAS ASSOCIATION, INC.
447 SUTTER STREET, SAN FRANCISCO, CALIFORNIA

**MINIATURE REPRODUCTION**
**of full page advertisement scheduled in "Architect & Engineer" and "California Arts & Architecture." Features gas heating in Alexander Hamilton Hotel, San Francisco.**

## Publicity and Advertising Section Launches Enlarged Cooperative Load-Building Plan

*By* **AL C. JOY**
***Chairman, P.C.G.A. Cooperative Advertising Committee***

THE seventh consecutive cooperative load-building program of the P. C. G. A. was launched in January, under the direction of the Publicity and Advertising Section.

### "SUNSET" MAGAZINE IS ADDED

Marking the resumption of home-consumer advertising, a schedule of six ⅔-page advertisements in "Sunset" Magazine has been authorized, starting with the March issue.

"Sunset" is the only general magazine of Coastwide circulation (total, 200,000). Its editorial appeal is principally to middle-class urban and suburban homes, comprising the best market for modern gas appliances.

### TRADE JOURNAL ADVERTISING

To the trade journal list has been added "Pacific Factory," which will carry a schedule of 12 full pages, featuring important industrial gas installations on the Pacific Coast. The complete trade journal list follows:

**Construction and Modernization Market**
Architect & Engineer.....12 full pages
California Arts & Architecture.....6 full pages
Southwest Builder & Contractor.....
.....12 insertions, ⅔ page each
Daily Pacific Builder.....24 insertions, 33 in. each

**Metal Industries Market**
Western Machinery & Steel.....12 full pages

**Dairy Products Market**
Pacific Dairy Review.....
.....12 insertions, ½ page each

**Candy Manufacturers**
Western Confectioner .....
.....12 insertions, ½ page each

**Commercial Baking**
Western Baker & Pacific Baker.....12 full pages

**Laundries, Cleaners**
Pacific Laundry Journal & Dry Cleaner.....
.....6 insertions, ½ page each

**Commercial Cooking**
Pacific Coast Record & Western Restaurant....
.....12 insertions, ⅔ page each
Keeler's Pacific Hotel Review.....
.....4 insertions, ⅔ page each
Western Hotel Reporter.....
.....4 insertions, ⅔ page each

**General Manufacturing, Industrial Market**
Pacific Factory.....12 full pages

**Appliance Dealers**
Western Plumbing & Heating Journal.....
.....12 insertions, ⅔ page each
Western Furniture & Appliance Retailing.....
..... .....12 insertions, ½ page each

With the exception of certain "general" advertisements, specialized "copy" will be prepared for each group, featuring actual installations and testimonials as heretofore.

### TECHNICAL NEWS SERVICE CONTINUES

With a background of continuous success in placing news items and feature articles in leading trade journals of the entire Pacific Coast, our Technical News Service will continue and enlarge its activities during 1935.

James R. Ferguson, who has carried on this work for the Association for several years, has become a member of the staff of the Association's advertising agency. In his new connection, he will continue the publicity work, which will now be even more closely co-ordinated with the advertising.

### ASSOCIATION "POINTS WITH PRIDE"

It is certainly to the credit of our 42-year-old Association that its Officers, Directors, and participating Gas Companies have carried on consistently, for six years, this cooperative load-building activity, and have voted to continue during 1935.

As the cumulative effects increase, through constant repetition, month after month and year after year, this P. C. G. A. program undoubtedly has a powerful influence in creating acceptance for gas appliances and industrial installations, breaking down sales resistance. Thus it paves the way for easier, cheaper selling by the entire Industry.

In no other section of the country has the Gas Industry "pulled together" so long, so consistently and so effectively in advertising and sales promotion programs. A fact to which the entire P. C. G. A. membership may "point with pride."

# *With the* ASSOCIATIONS

## P.C.G.A. Spring Conference Dates Set

WM. MOELLER, JR., president of the Pacific Coast Gas Association, has announced that the Spring Technical Conference will take place at Los Angeles on Thursday and Friday, March 7 and 8. One week later, on Thursday and Friday, March 14 and 15, the Spring Sales Conference will assemble in the same city, the Commercial and Manufacturers' Sections participating in its program.

A. R. Bailey, chairman of the Technical Section, will direct the Technical Conference and Frank Talcott, chairman of the Commercial Section, will act as chairman of the Sales Conference assisted by E. L. Payne, chairman of the Manufacturers' Section. Announcements outlining the scope of the discussion will be mailed to Association members about two weeks prior to the meetings.

### Publicity and Advertising Section Holds January Conference

At the call of Chairman J. S. Spaulding the Publicity and Advertising Section of the Pacific Coast Gas Association met in Los Angeles on January 18 to discuss cooperative advertising plans for 1935, as prepared by A. C. Joy, chairman of the Cooperative Advertising Committee. The schedules submitted and approved are shown in some detail in the Committee's announcement appearing on the opposite page. Proofs of all advertisements will be sent to participating companies and reprints furnished as desired. The balance of a full day's conference was devoted to discussions of other means of advertising and publicizing gas usage in ways to aid the load building programs of gas companies.

### Public Relations Section to Survey Educational Methods

R. R. Blackburn, Public Relations Section Chairman, has announced that the Section will make an intensive study of educational methods in use by utility companies, both in the direction of job training and general education. Lee Holtz, Southern California Gas Co., will supervise the job training program, and attention of members is called to the articles by Mr. Holtz which appeared in November and January issues of *Western Gas*. Guy Wadsworth, Jr., Southern Counties Gas Co., will have charge of the investigations on general educational courses. The Section will also conduct a critical study of customer relations practices.

### Special Sales Studies Under Way in Commercial Section

L. J. Brundige, chairman of the P.C.G.A. Commercial Section's Committee on Coordination of Sales Activities, has assigned the study of salesmen's compensation to E. J. Ludeman, Washington Gas & Electric Co.; of specialty selling to L. C. Rausch, Coast Counties Gas and Electric Co., and E. W. Kimmell, Pacific Gas and Electric Co.; and of sales promotion through dealers to K. G. Martin, Portland Gas and Coke Co.

Frank Packer, Welsbach Co., has accepted the chairmanship of a committee to study the customer market for domestic gas appliances. As members of the committee, F. U. Naylor, Pacific Gas and Electric Co., will report on the utilization of market surveys; E. B. Hanmer, American Stove Co., on factors affecting the market for new appliances; and J. H. Grayson, Grayson Heat Control, Ltd., on methods for widening the market.

### A. G. A. Automatic Refrigerator Tests Survey Under Way

Jane Tiffany Wagner, director of the home service department of the Electrolux Refrigerator Sales division of Servel, Inc., has been assigned the task of compiling data for the American Gas Association National Home Service Committee, of which she is a member, regarding tests made on all types of automatic refrigerators conducted in the laboratories or engineering departments of American colleges and universities. The survey will enable the Association to present authentic information on the performance of gas-operated refrigerators as compared with other types. Results of the findings will be available before the close of 1935.

### Bringing Natural Gas and Petroleum Codes in Line

The American Gas Association announces that the Natural Gas Code Committee has agreed with the National Industrial Recovery Administration to recommend to the industry a modification of the pending natural gas code so that the minimum wages and maximum hours for rig building and well drilling, but not operation, in natural gas fields shall correspond to the minimum wages and maximum hours for the same classes of employees as specified in the petroleum code, and has further agreed that pending final disposition of the natural gas code the above suggested modification shall apply to the President's Reemployment Agreement as modified under which the natural gas industry is now operating.

### A.G.A. Industrial Gas Advertising

The firm of Ketchum, McLeod and Grove, Pittsburgh, Pa., has been selected by the American Gas Association to handle the industrial gas advertising of the Association's Industrial Gas Section. Space will be taken in the national technical business papers.

## Calendar

**February**

*Mid-West Regional Gas Sales Conference*—Sherman Hotel, Chicago, Ill., February 14-15.

*Southern-Southwestern Regional Gas Sales Conference*—Dallas, Texas, February 20-22.

*Eastern Natural Gas Sales Conference*—William Penn Hotel, Pittsburgh, Pa., February 28-March 1.

**March**

*Pacific Coast Gas Association Spring Technical Conference*—Los Angeles Gas and Electric Corp. Auditorium, Los Angeles, Calif., March 7-8.

*Oklahoma Utilities Association*—17th Annual Convention, Biltmore Hotel, Oklahoma City, Okla., March 12-13.

*Pacific Coast Gas Association Spring Sales Conference* — Commercial and Manufacturing Sections. Los Angeles Gas and Electrc Corp. Auditorium, Los Angeles, Calif., March 14-15.

**April**

*American Chemical Society* — Semi-Annual Meeting, New York, N. Y., April 11-13.

*Mid-West Gas Association*—30th Annual Convention, Hotel Fontenelle, Omaha, Neb., April 15-17.

*Missouri Association of Public Utilities*—Annual Convention, President Hotel, Kansas City, Mo., April 25-26.

**May**

*Natural Gasoline Association of America*—Annual Convention, Hotel Tulsa, Tulsa, Okla., May 1-3.

*A. G. A. Annual Distribution Conference*—Cleveland Hotel, Cleveland, Ohio, May 2-4.

*A. G. A. Natural Gas Department*—Hotel Peabody, Memphis, Tenn., May 6-9.

*A. G. A. Joint Conference of the Production and Chemical Committees*—Hotel New Yorker, New York, N. Y., May 13-14.

**June**

*Canadian Gas Association*—Annual Convention, Montreal, Quebec, Canada, June 10-11.

*American Home Economics Association*—Annual Meeting, Chicago, Ill., June 24-28.

**October**

*American Gas Association*—Atlantic City, N. J., October 14-18.

**November**

*American Petroleum Institute*—16th Annual Meeting, Biltmore Hotel, Los Angeles, Calif., November 11-14.

*Mid-West Gas School and Conference*—Iowa State College, Ames, Iowa.

### Heads Peoples Drafting Department

Reinhold O. Siegmund, an employee of The Peoples Gas Light and Coke Co. for the past 25 years, has recently been placed in charge of the drafting department of the company, as successor to Rudolph Schenck, who died last June.

# Setting Up Natural Gas Department Spring Meeting

LOOKING forward to resuming the annual spring meeting, after missing 1934, representatives of the Natural Gas Department General Arrangements, Program, Publicity, and Entertainment committees, met at the Peabody Hotel in Memphis on January 18, to lay the ground work for the May 6-9 Memphis sessions. J. B. Tonkin, Peoples Natural Gas Co., Pittsburgh, this year's chairman of the Department, presided. A tentative program outline was developed, and several appointments made for arrangement of various program features.

It was determined to hold general sessions on Tuesday and Wednesday mornings, May 7 and 8, with parallel sessions Tuesday and Wednesday afternoons. There will be two afternoon sessions on sales and utilization, with one parallel session on gas production on Tuesday afternoon, and another parallel session on Wednesday afternoon on the subject of transmission, including compressor stations.

The Tuesday morning general session will be devoted to technical subjects, H. C. Cooper, Hope Natural Gas Co., Pittsburgh, chairman of the Department's Main Technical and Research Committee, being in charge of this program.

Sales and utilization phases of the program will be arranged under the chairmanship of W. W. Winters, Atlanta Gas Light Co., Atlanta, with J. V. Strange, United Gas Public Service Co., Houston, as vice-chairman.

R. W. Hendee, Oklahoma Natural Gas Co., Tulsa, was named chairman and Don Wilson, Columbia Gas and Electric Corp., New York City, vice-chairman for arrangement of the gas production section.

The transmission section of the program will be set up by Elmer F. Schmidt, Lone Star Gas Co., Dallas, and John Clark, Hope Natural Gas Co., Pittsburgh, chairman and vice-chairman, respectively, for this section.

Business sessions will close Thursday noon, with the afternoon devoted to sports. A banquet Wednesday evening, ladies' bridge and luncheon Tuesday afternoon, and special entertainment Monday evening will feature the lighter side of the convention. Registration fee will be $2, with an additional $1.50 for banquet ticket.

A program sub-committee consisting of J. B. Tonkin and William Moeller, Jr., chairman and vice-chairman of the Department, respectively, and A. E. Higgins, Department secretary, will review papers prepared through the sectional chairman for consolidation in the final program.

## Munroe to Head Midwest Industrial Gas Sales Conference for 1935

H. J. MUNROE of the Milwaukee Gas Light Co. was elected chairman of the Midwest Industrial Gas Sales Conference at the regular meeting of the group held January 17 in Chicago, succeeding George Uhlmeyer of the Peoples Power Co. of Moline, Ill. Other officers elected were Porter W. Hay of the Public Service Co. of Northern Illinois, vice-chairman; and A. J. Huegel, Milwaukee Gas Light Co., secretary.

The afternoon sessions of the conference were largely given over to a presentation of actual sales experiences as related by members of the council. Among those bringing these experiences were R. H. Lind, of the Peoples Light Co., Davenport, Iowa, who gave the steps involved in the conversion of a real type cracker oven from oil to gas; and C. K. Lekberg of Northern Indiana Public Service Co. who told how his company has converted a continuous carburizing furnace to a continuous normalizing furnace. L. R. Foote of the Central Illinois Electric & Gas Co., Rockford, gave a resume of the 1934 A.G.A. convention with particular reference to the industrial sessions. James Whammond, outgoing chairman of the program committee, arranged for the speakers.

Representatives from Illinois, Wisconsin, Indiana, Iowa and Missouri, attended the conference.

## Bulletin on Gas Possibilities In Whatcom Co., Wash.

Oil and gas possibilities in western Whatcom County, Wash., are covered in a bulletin which was scheduled to be released in January through the Department of Conservation and Development at Spokane, Wash. The report is a result of an eight months' survey in the territory by Sheldon L. Glover, assisted by W. G. Bennett and S. N. Twiss, all of the division of Geology, State of Washington. It covers shallow gas field area, testing recommended on several anticlines, and includes an areal structural map of the territory. The findings indicate that possibilities for commercial gas production from shallow fields are good in that particular area.

## Corbonization Test Results Available Through A.G.A.

Results of comprehensive carbonization tests on 30 coals and coal blends have just been announced by the U. S. Bureau of Mines, Department of the Interior, and the American Gas Association in Bureau of Mines Monograph 5, "Gas-, Coke-, and By-product-Making Properties of American Coals and Their Determination," by A. C. Fieldner and J. D. Davis. Copies of Monograph 5 may be obtained from the American Gas Association, 420 Lexington Ave., New York, N. Y.

## Chas. A. Lanzit Appointed Resident Engineer for N.G.E. in San Joaquin

Chas. A. Lanzit, associated with the Natural Gas Equipment Co., Los Angeles, Calif., for over eight years, has been appointed resident engineer for the San Joaquin area. Mr. Lanzit's headquarters will be 516 Chester Avenue, Bakersfield, Calif. According to Douglas Balthis of the N.G.E. organization, the appointment of Mr. Lanzit has been necessitated by the company's increasing burner, regulator and control business from the utilities and oil industry in the San Joaquin area.

## Another "Three Little Meters" Booklet Off the Press

Following publication of their first well received booklet, "The Three Little Meters and the Telephone," A. J. Wager and R. A. Aschenbrener, secretary and treasurer, respectively, of The Triple Insulaire Co., Milwaukee, Wis., have taken pens in hand and turned out another story featuring the same characters—Washo, the water meter—Wattso, the electric meter—Gaso, the gas meter—and Hello, the telephone. This time the subject is the fallacies of government water power projects, and the title of the story is "The Three Little Meters and the Telephone Become 'Dam Conscious'." In conversational style the four characters give an exposition of the theme which is clearly put and easily followed. A sample copy of the booklet may be had by sending 25c to The Triple Insulaire Co., 161 W. Wisconsin Avenue, Milwaukee.

## Stacey Mfg. Company Now Operated By Former Management

Reorganization of The Stacey Manufacturing Co., Cincinnati, Ohio, has been effected to bring it again under the active management of the group of individuals responsible for its operation prior to 1931. The group, composed of Alvin A. Ranshaw, president and general manager, Wm. W. Birch, vice-president, Edw. J. Baechle, secretary and treasurer, Geo. H. Cressler, vice-president in charge of sales, and Frank O. Pandorf, vice-president in charge of engineering, has purchased all assets of the company, and announces that it is in no way connected to or affiliated with any other company.

## Peoples Gas Employees to Charter Credit Union

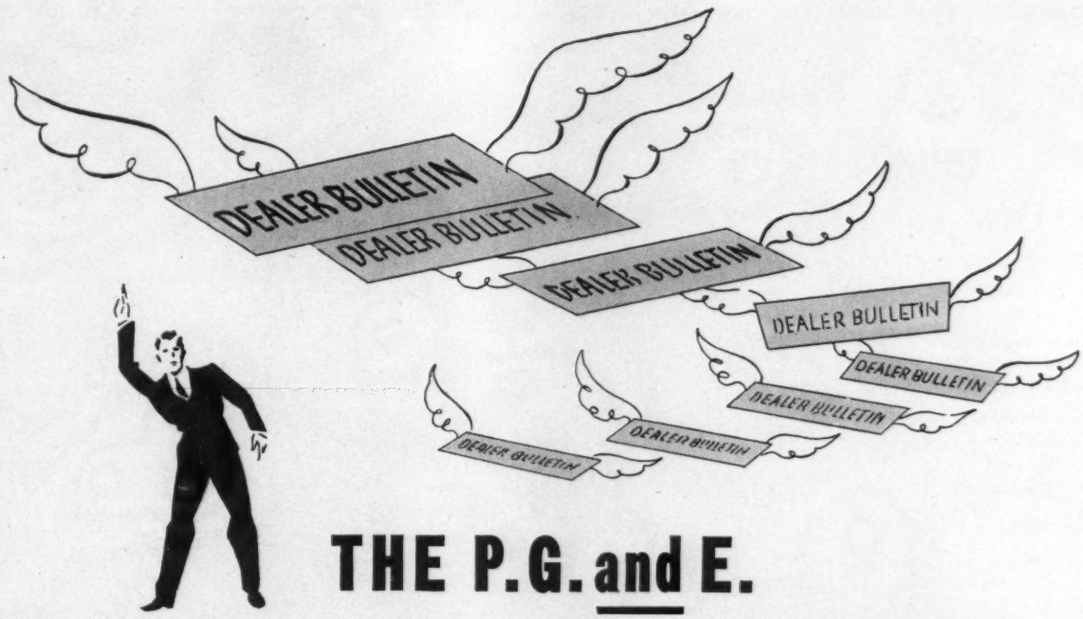
A group of employees of The Peoples Gas Light and Coke Company have made formal application to the State of Illinois for a charter leading to the incorporation of an employee credit union, which will provide a loaning fund for members seeking credit at reasonable rates of interest and also provide a plan of systematic saving. The organization will be wholly controlled by employees, with the company having no financial obligation in the union nor exercising any supervision whatever over its operation.

## Meade Managing San Angelo Property

E. J. Meade, formerly general superintendent of the Texas Public Service Co.'s San Angelo district, has been made manager of the district, succeeding P. E. Drachman, who has retired from gas industry activities. Mr. Meade was with the Southern Kansas Gas Co. and the Oklahoma Natural Gas Corp. before going to the Texas Public Service Co., which headquarters at Austin, Texas.

## Payne Opens New Dallas Warehouse

The Payne Furnace & Supply Co., Beverly Hills, Calif., has discontinued operations at the Dallas (Texas) Transfer and Terminal Warehouse, and has established a company warehouse at 2405 South Harwood St., Dallas, to serve the Texas-Louisiana district.

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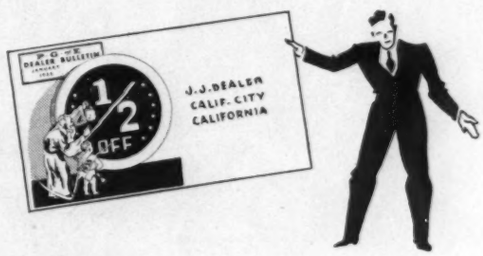


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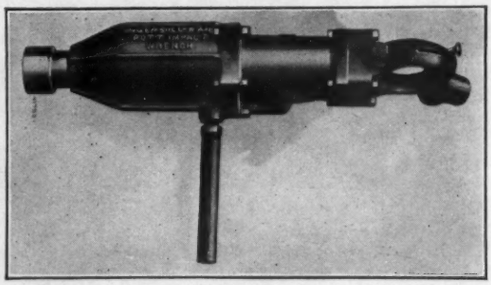
## Ingersoll-Rand Co. Markets New Impact Wrench



INGERSOLL-RAND CO. of Phillipsburg, N. J., has announced the development of the Ingersoll-Rand Pott impact wrench. The wrench weighs only 20 pounds and is one-man operated. In the product is incorporated a principle new to the pneumatic tool field, that of the rubber "accumulator." This is a cylindrical block of special rubber interposed between the "multi-vane" air motor and the chuck. The "multi-vane" air motor drives the impact wrench unit, which is made up of an accumulator, hammer and anvil, all enclosed in a hammer case.

As torque from the motor is applied to the accumulator the twisting action shortens the rubber section, lifting the hammer from its seat. The energy stored in the accumulator drives the hammer forward so that it delivers a rotary blow to the anvil, on the end of which is attached the chuck.

These torsional impacts occur at the rate of 1,200 to 1,400 per minute and exert a powerful turning effect, making it possible to remove nuts which could not be taken off except by splitting with a chisel or burning with a torch.

The accumulator absorbs the torque and eliminates the danger of shock or injury to the operator.

Descriptive pamphlet No. 2152, on the Pott impact wrench, may be obtained by addressing the company at 11 Broadway, New York N. Y.

## Pacific Lighting 1934 Income Lower; Meters Show Gain

In the Pacific Lighting Corp.'s year-end statement net income of $2.72 per share on outstanding common stock was reported, a decrease from the $3.28 per share for 1933. Net income declined $855,048 or 10.8 per cent from 1933, and gross operating revenues were reduced by $1,314,470, due to decline in domestic and commercial gas revenues of 11.4 per cent, occasioned by continued warm weather. Active meters increased 3.2 per cent for the year.

Despite the decline in revenues, taxes amounting to $5,848,655 continued at a high level in 1934 and were approximately 33 per cent more than was available for dividends to common stockholders.

Revenues from industrial gas sales for 1934 showed a 24.2 per cent gain over 1933, reflecting the gradual revival of industrial activity in Southern California.

## Welding Conference to Be Held At Texas Technological College

February 14 and 15 have been selected as dates for the first annual welding conference on electric and oxy-acetylene welding to be held at Texas Technological College, Lubbock, Texas.

All manufacturers and jobbers of welding equipment have been invited to display and demonstrate their equipment. The sessions are open to everyone interested in welding, and will feature lectures, motion pictures and demonstrations on various phases of welding.

Inquiries should be addressed to H. F. Godeke, professor of mechanical engineering, Texas Technological College.

## Morehead, Ky., to Have Gas Service

The North Fork Gas Co., headed by L. C. Young, has obtained a 20-year franchise to serve Morehead, Ky. The company intends to begin construction of pipe lines from its supply source in the North Fork field to Morehead immediately.

## Industrial, Heating Sales Up For No. Ill. Public Serv. Co. System

The industrial gas sales department of the Public Service Co. of Northern Illinois, Chicago, sold three times as much gas for industrial purposes in 1934 as was sold in 1933, according to C. F. Henness, manager of the department. Improved business conditions and a broadening of the market possibilities for this type of service were the important factors entering into the increase. Brick and glass industries, and steam generation utilize large quantities of the fuel.

The annual report of the gas house heating sales department of the company revealed that over 4,800 heating jobs were sold during 1934, these going into commercial and residential installations. T. A. Swigert led the field in sales with 147 installations to his credit.

## Gas Service Co. 1934 Appliance Sales Approach $1,000,000

New Business Departments of The Gas Service Co., headquartering in Kansas City, Mo., reported for 1934 the largest increase in appliance and installation sales since 1931. Sales for the combined new business departments amounted to $919,119 for the year 1934, more than $225,000 greater than the amount of sales reported in either 1933 or 1932.

Total number of appliances sold by the company's new business departments in 1934 was 11,987. This number included 5,187 ranges, 462 furnaces and boilers; 999 conversion burners; 98 unit heaters; 1,397 large capacity space heaters; 119 renovizing jobs; and 1,811 radiant type heaters.

## China Factory May Be Served

The construction of a 4-inch pipe line from the plant of the Central Illinois Electric and Gas Co. at Lincoln, Ill., to the Illinois China Co. factory is under consideration. Cost of the line is estimated at $7,000. Natural gas will be utilized in firing pottery kilns.

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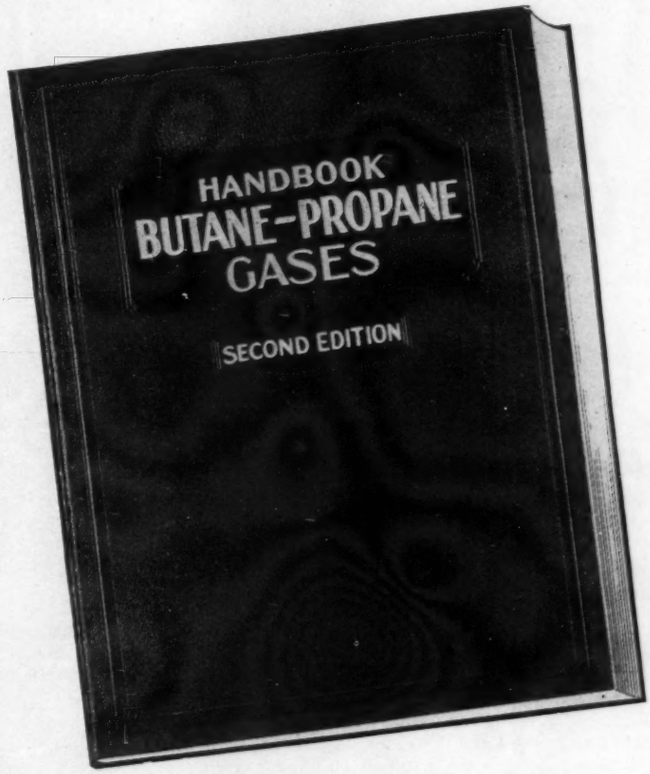


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**SUMMARY OF DEVELOPMENTS:** Brief review of progress during past two years since publication of first edition, including foreign expansion, new industrial uses, new manufacturing sources, new plant and equipment design, etc.

**USE IN INTERNAL COMBUSTION ENGINES:** A comprehensive discussion of liquefied petroleum gases in this important new use including engine design, comparison of propane and butane with other fuels, use in stationary engines, block testing automotive engines; use in rail cars, trains and locomotives; use in automotive engines; refrigerator cars and trucks; dirigibles and aeroplanes; utilization equipment such as carburetors and mixers, vaporizers, fuel tanks, valves and fittings, etc.; consideration of safety in relation to internal combustion engine use of these gases.

**DESIGN AND INSTALLATION OF STORAGE:** A basic chapter analyzing the several codes now applying to liquefied gas storage, including the National Fire Protection Association Rules, A. P. I. Pressure Vessel Code, California Liquefied Petroleum Gases Safety Orders, proposed California pressure vessel safety orders, etc. Fundamental discussion of good design practice touching such phases as determination of working pressure, design of shell, design of heads, reinforcement of openings, fabrication of vessel; shop inspection and hydrostatic tests; emergency relief provisions. Separate discussion of installation for permanently installed vessels (above ground); underground storage; skid tanks; fuel tanks for tractors and trucks. Also sections on piping for butane tanks, gauging methods, protection of gauging and emergency relief devices.

**SUPPLY FROM PETROLEUM REFINERIES:** Characteristics of refinery gases with reference to liquefied gas production. Detailed discussion of oil absorption and compression processes for liquefied gas recovery; fractionating columns; extraction of ethane from refinery vapor.

**ENGINEERING DATA ON THE LOWER OLEFINS:** A basic reference chapter consisting of tables on properties of liquefied petroleum gases produced from petroleum refineries; a companion chapter to that in the original Handbook on properties of the natural-gas-produced liquefied petroleum gases.

**DOMESTIC APPLIANCE TESTING AND UTILIZATION:** Separate discussions of undiluted and carbureted gases from the standpoint of their burning characteristics. Appliance testing procedure on liquefied petroleum gases, with special reference to American Gas Association methods. Fundamentals of appliance design for proper use of these gases. Latest A. G. A. Laboratory Approval requirements. Standards of construction and performance for gas appliance accessories.

**COMPETITIVE POSITION OF THE LIQUEFIED GASES:** Economic comparisons, illustrated by ready-reference charts, comparing liquefied gas costs with cost of electricity, kerosene, oil, manufactured and natural gas, coal, etc.

**TOWN PLANTS:** A new chapter combining discussion of butane-air and undiluted types of plants. Written from a practical operating standpoint and giving latest information on new plant equipment as well as present trends in over-all plant design. A section is included on fundamentals of distribution design, plant operating problems, etc.

**MANUFACTURE FROM NATURAL GAS:** A new chapter dealing with the natural gasoline plant process, with special reference to operations involved in liquefied gas recovery. Flow diagrams assist in presentation of plant processes.

**SPECIAL USES:** Orchard heating, construction camp use, and various special applications such as cutting and welding.

**SUPPLEMENTS AND REVISIONS**

A number of chapters in the first edition have been retained for the second edition, with additions and modifications made by their original authors to bring them in line with present knowledge. Late information will be found in the Handbook on:

**TRANSPORTATION:** New material on motor truck and trailer design, describing typical equipment in use, pumps for loading and unloading, etc.; current railway freight rates; requirements for shipping by water, etc.

**USE WITH OTHER GASES:** An added section on standby gas, also further discussion of reforming, use of propane for underfiring coke ovens, and use of butane or propane with coal gas under peak load conditions.

**ANALYSIS AND TESTING:** Specifications for commercial grades, test procedure for determination of specific gravity, water content, vapor pressure, etc. The above and other additions have been made to the chapter on Composition and Analytical Determination.

**PROPERTIES OF MIXTURES:** Additional curves have been drawn including those on dew points of butane, propane, and typical mixtures, carbureted with air; curves showing relation between B.t.u. and specific gravity.

**BOTTLED GAS DISTRIBUTION:** This chapter has been brought up to date, with sections on foreign sale of bottled gas, present trends in bottled gas merchandising, new types of service equipment being developed.

**BIBLIOGRAPHY:** This valuable feature of the first edition has been extended to list worthwhile material published during the past two years.

**CENTRAL PLANT DIRECTORY:** A new town plant directory numbering all operating plants as well as several to be constructed in the future; will give information secured directly from the companies on plant location, number of meters, type of service, plant capacity, rates, etc.

**CATALOGUE SECTION:** Current detailed engineering information on the many products now manufactured for special service on butane and propane.

**BUYERS' GUIDE:** Revised commodity listing of firms supplying equipment, appliances, or services for the liquefied petroleum gas industry.

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# A New Circular on "Standards for Gas Service"

*By* E. R. WEAVER

*Chemist, National Bureau of Standards**

A NEW circular, C 405, of the National Bureau of Standards, entitled "Standards for Gas Service," has just been released for distribution.

The title is the same as that of the last edition of Circular 32, with which many readers of *Western Gas* are familiar, but the text has been completely rewritten, and there are numerous additions and some omissions of topics.

The purpose of the circular is stated in these words:

"A city gas supply is a supply of energy in a form that is always available, easily controlled, and easily conveyed to a desired point and there converted into heat. The conditions which are essential to good service are easily defined. They consist merely in making the supply of energy available in sufficient quantity at all times to all parts of the territory served by the company under conditions which permit its satisfactory control; in correctly measuring the energy sold to each customer; and in giving the customer such information and assistance as will enable him to use the supply with safety and satisfaction. To describe and discuss these conditions in detail is the purpose of this circular."

The requirements for service stated in the rules of a state commission or in a municipal franchise are regarded simply as a business agreement of the company with its customers. It is recognized that, as in the case of other commodities, the purchaser of gas must expect to pay the additional cost which any of the specifications make necessary. It is also recognized that the gas company is usually in better position than anyone else to determine how a desirable result may be accomplished most economically. The recommendations in the circular, therefore, are directed toward eliminating requirements that are not worth what they cost, and toward defining customers' interests rather than operating practice.

Important changes in the recommendations formerly made with respect to heating value, meter testing, and pressure control are in the direction of thus giving the company greater freedom in the conduct of its operations.

The customers' interest in heating value is limited to the cost of energy, that is, the number of B.t.u. received for a dollar. Any arrangement by which the cost of energy is made definite and the gas companies are left free to choose or change their own "standards" of heating value in accordance with economic and engineering considerations should result in improvements, or at least in serious attempts to determine whether improvements are possible. The practice recommended is substantially that officially adopted a number of years ago by the Public Utilities Commission of Colorado, and practically though not formally pursued by the California Railroad Commission and others in recent years.

The heating values of natural gas and of butane-air mixtures are discussed at considerable length. It is concluded that the requirement of a minimum heating value for natural gas is wholly undesirable and that sale at definite rates per heat unit is imperative. It is pointed out that improved service and greater economy would result from heating values higher than are customary from butane-air plants.

The chief innovation recommended with respect to meter-testing is that of adding, to the usual requirement for periodic tests, the provision that no test shall be required in case the amount of gas used is such that the overcharge likely to result from inaccurate registration is not equal to the cost of testing. If generally adopted, this provision would result in considerable economy by eliminating about 75 per cent of the required meter-testing, the results of which are not of sufficient importance to justify its cost.

The recommendations with respect to the control of pressure are intended to make possible the more definite adjustment of appliances to their correct "ratings," and at the same time to simplify the control of pressures in the system and the determination of compliance with the requirements. The essential feature of the recommendation is the establishment of definite maximum district pressures which serve as the guide for both appliance adjustment and operating control.

One new feature of the circular is a section, with several illustrations, devoted to explaining the essentials of appliance adjustment and their relationship to conditions of service, particularly the composition of the gas. Another is a complete summary of existing state rules relating to gas service. Numerous tables summarize the replies of gas companies to a questionnaire intended to ascertain the consensus within the industry as to what constitutes good practice. The last section is a popular description of the various sources and methods of manufacture of the gases which enter public supplies, and their properties. Some discussion is given to the more obvious economic considerations involved in the choice of the gas to be delivered.

Circular No. 405 contains 258 pages, 27 line drawings and 32 tables. It can be obtained from the Superintendent of Documents, Washington, D. C., for 20 cents.

*Publication approved by the Director of the National Bureau of Standards.

## Cart Succeeds Harding as President No. Dak. Railroad Commissioners

The Board of Railroad Commissioners of North Dakota has elected Elmer W. Cart president to succeed Fay Harding, president for the past two years, whose term expired early in January. Mr. Harding was elected railroad commissioner in 1922 and has served continuously since that time.

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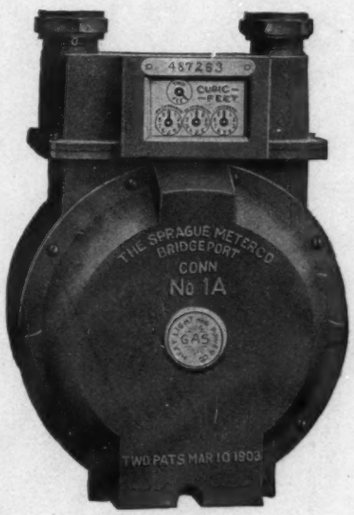


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# VALVES

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AUTOMATIC SHUT-OFF
BACK PRESSURE
BALANCED LEVER
D.W. SAFETY
LEVER OPERATED
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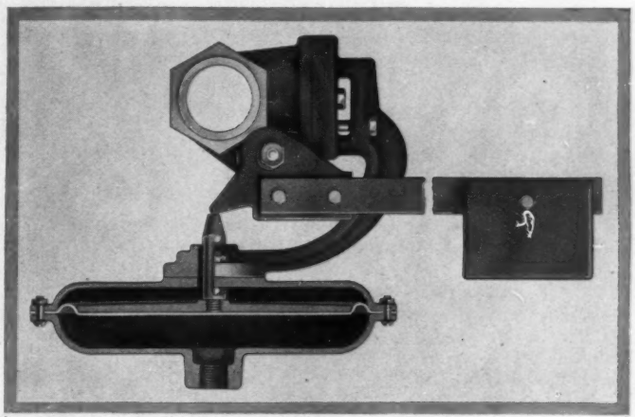

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READY — Your copy of the Reynolds New Low Pressure and Appliance Regulator Catalog. (Catalog L, Section 3.) Write for it!

## REYNOLDS GAS REGULATOR CO.

**Anderson, Indiana, U. S. A.**

GAS CONTROL SINCE 1892

# C R C—A "Customer Relations Code"

*(Continued from Page 11)*

It goes without saying that rates should be kept as low as circumstances permit and that domestic rate schedules should be easily understood by lay persons.

(7) The employee who is genuinely interested in his own progress must constantly study himself as well as his job. Constructive self-criticism coupled with a desire to improve is the key to advancement. Customer contact employees who really please customers are those who want to do so.

(8) If a gas company only knew which customers were dissatisfied and could learn the causes of their dissatisfaction it would be a comparatively simple matter to correct all errors which really exist and explain away misunderstandings due to imaginary causes. Knowledge of questions, grievances and misconceptions on the part of patrons is a great asset to a utility company. All employees ought to pledge themselves to promptly acquaint the company of opportunities to serve, educate and pacify its customers. It is a comparatively simple matter to note down comments heard outside office hours and hand them to the department concerned. Many companies have systems for handling such reports and for keeping their personnel constantly reminded of their duty in this respect.

(9) The inclination to excuse one's errors is a human frailty. Every individual must expect to make some mistakes. We must constantly guard against errors but when one does occur which affects a customer it is a good plan to admit it frankly, promptly correct it and apologize sincerely.

(10) "It's against the company rule" or "We are not allowed to do that," are too often heard by customers. Rules of policy are necessary in order to obtain uniform interpretation of practice, but the reason which prompted the adoption of the rule, not the rule itself, is the reason for not doing the thing requested. A majority of customers will be quick to see the reason for the prohibition if it is properly explained to them. There is never an excuse for quoting a rule.

(11) A policy of advising customers concerning approved methods of economizing in the use of gas pays good dividends in the form of better customer relations. It has been demonstrated that any increase in revenue obtained from gas wasted or uneconomically applied is more than offset by the extra expense of investigating high bill complaints and the loss of good-will.

(12) Matters which have become common-place to gas company employees are quite complicated and obscure to the average customer. Customers are usually not sufficiently interested in our business to study its intricacies and seldom have the opportunity to inform themselves even if they are interested. It is a difficult task to answer "foolish questions" all day long, but it is somebody's job, and the person who cannot sympathetically, courteously, and intelligently handle each customer who steps up is not the individual for that particular job. In talking to a customer it is a good plan to first explain the reasons which lead to your conclusion and allow the customer to see the conclusion instead of stating the conclusion and afterwards reciting the facts which are supposed to justify it.

(13) Customers who go to the trouble of registering a complaint with the company nearly always honestly believe that their cause is justified. Except in cases where the cause of misunderstanding is obvious it is unfair to disagree with the complainant until the facts are obtained. The investigator who goes into the customer's home, flashes his torch on the meter and hastens to argue that the gas must have been used is a source of much irritation to customers. By making a physical inspection the representative can prove his interest in the customer's problem. The knowledge that you sought to find something wrong and could not do so satisfies and reassures many complaining customers.

(14) A gas company employee's courtesy should not be of the fawning, conventional sort, but a display of sympathetic interest and good manners. A courteous organization is bound to be well liked. The "Thank You" habit is another important company asset only when the words are meant and said in proper manner.

(15) The individual who is a good citizen is bound to be a better employee. The company owes a duty to the community of which it is a part and from which it derives its revenue, and this duty can best be fulfilled by having its personnel take pride in the community and faithfully discharge their duties as citizens.

(16) A proper attitude toward your company is essential in the rendering of good service. One must love his job to have its proper interests at heart. The company which gives you employment must be "your company."

*And Finally*

Having completed the review of customer relations ideas which make up our "code" and having commented on each in turn we admit again that nothing new has been offered, but we insist that much can be accomplished by focusing attention on the need for greater interest in those things which affect service and mold the opinion of our customers.

It will be noted that the statement "The customer is always right," does not appear once in this treatment. It is an undebatable fact that customers are not always right and that many of them refuse to admit it even when they know they are wrong. It is not necessary for any company to go beyond the bounds of reason in its treatment of customers for customer relations reasons. Where firmness is necessary it should be employed, but in all such matters improvement can be effected at small expense if the organization is brought to realize the importance of gaining and holding the good-will of those we serve.

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The time-tested Mueller line includes Mueller Evenflow Service Regulators, Gas Stops, Service Stops, Stove Stops, Drilling and Tapping Machines, service boxes, meter trims and similar equipment. Write for description and prices.

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Equipped with Improved Patented Locking Sleeve, which locks both handles to the pipe. Stopper cannot slip. Gas cannot pass.

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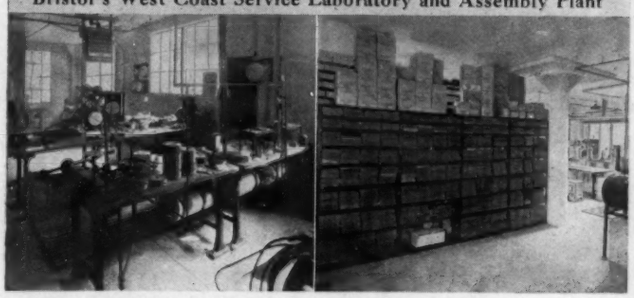

Whenever you need spare parts for your Bristol's Recorders or additional supplies of charts or ink, get in touch with our San Francisco or Los Angeles Branch Office. Perhaps you may even wish to remodel an old recorder in order to use it under today's changed working conditions. If you do, you will find our facilities complete to serve your instrument needs promptly.

In returning recorders for reconditioning or modernizing, pack carefully and ship direct to The Bristol Co., 311 Minna St., San Francisco. Also send shipping notice and order authorizing work to nearest branch office.

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*Branch Offices: Rialto Bldg., San Francisco..747 Warehouse St., Los Angeles..*
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# BRISTOL'S

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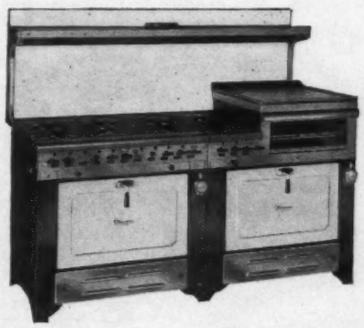
PIONEERS IN PROCESS CONTROL SINCE 1889

## these NEW Wedgewood Restaurant Ranges

### handle every HEAVY DUTY Cooking Need



BECAUSE—they have greater actual cooking capacity than old fashioned ranges, yet are more compactly built and occupy less space. They cook better—look better and are more economical to use because they are well-built, heavily-insulated and MODERN.

Oven sides have 3½" of rock-wool which ends "gas-eating" and keeps the kitchen cool. Their splendid, clean appearance meets the public's demand for unquestionable cleanliness. The automatic temperature-controlled ovens roast and bake with greater precision and less oven watching. They are ideal for Restaurants, Schools, Cafes, Hotels, Clubs, Churches, Barracks, Fraternities, etc.

The standard models are finished in black—the semi-deluxe have chromium trim and the full-deluxe sparkling white porcelain exteriors with chromium trim. Can be furnished with single ovens, double ovens, broilers and high shelves in practically any arrangement.

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*features include . . .*

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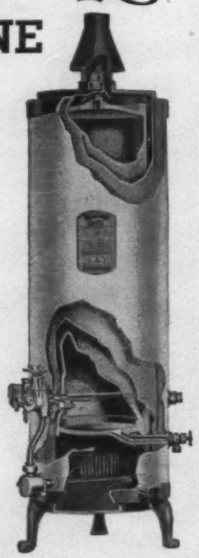
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San Francisco Los Angeles

# Compression Ratio-Efficiency Relation in a Gas Engine

*(Continued from Page 14)*

indicator card is shown to the left. It should be noted that for 80 pounds compression, the peak pressure varied from 236 pounds to 184 pounds as the inlet valve was rotated, and that for different "turbulence settings" the general shape of the card varied considerably. It was later found that the optimum position varied somewhat with different compression ratios. The salient points are that the efficiency appears to be a function of the peak pressure, as shown in the results of runs B-1, B-2, B-3, and that the skirt has a definite effect in smoothing out the operation of the unit.

The variation of peak pressure as the turbulence is changed has not been completely investigated. The basic expression for Otto cycle efficiency

$$E = 1 - \left(\frac{T_4 - T_1}{T_3 - T_2}\right)$$

indicates that a decrease in $T_3$ (or peak pressure) results in a decreased efficiency, and conversely. This suggests that the variation in turbulence changes the peak pressure by affecting the quality of combustion.

Tests B-4 to B-17 were made with the skirt in the position giving the smoothest operation, which also happened to be that giving a lower peak pressure. The results are somewhat inconsistent, particularly the exhaust gas analyses, but there is a definite trend toward improved economy at higher compression ratios up to about 7 to 1. This is brought out most clearly on the graph, Fig. 4. For purposes of comparison, the theoretical efficiency, using air as the working substance, is also shown.

*Conclusions*

The results of these tests indicate that the selection of the maximum usable compression ratio for a given case results in a definite, measurable saving in operating cost. The optimum ratio appears to be that which develops the maximum allowable peak pressure while using the best value of spark advance and fuel dilution, with complete combustion. Apparently when the compression so determined is exceeded, the resulting peak pressure can be suppressed to the allowable value only by using less efficient combustion. These observations are in accord with the theoretical expressions for efficiency of the Otto cycle, and they indicate that for best results, engines should be so constructed that the compression can be adjusted, in the field, to fit variations in the nature of the fuel.

The usefulness of proper turbulence in the suppression of detonation, and in general smoothing of operation, has been well recognized by automotive designers. It is hoped that these tests emphasize its application to gas engines. The combined effect of proper turbulence and compression ratio can be suggested by means of the following example, using the test engine as a basis:

Assuming a plant which averages 5,000 hp. daily throughout the year, for which

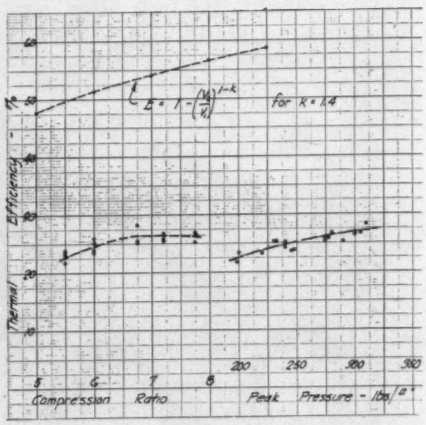


FIG. 4.

fuel gas costs 10c per M c.f., the difference in fuel consumption at compression ratios of 5.5 and 6.0 may amount to 9.66 — 8.97 = .69 cubic feet of gas per horsepower hour. During the 12 months' period, a total of 30,222 M c.f. would be saved at the higher compression, and the annual expense would be reduced by $3,022.20.

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Streeter & Lichty, Internal Combustion Engines.
Richards, Compressed Air Practice.
P.C.G.A., Gas Engineers' Handbook.
Marks, Mechanical Engineers' Handbook.

## New Gas Sampling Bulletin Issued by Calif. Natural Gasoline Assn.

The California Natural Gasoline Association has issued Bulletin TS 342, which supplants an earlier bulletin published in 1932 (TS 322), on sampling of natural gas and gasoline.

Describing in detail the technique to be followed, and precautions to be observed in sampling gases and liquids, the 13-page bulletin deals with design of proper containers, preparation of the containers for sampling, and methods to be followed in obtaining good samples.

The bulletin deals with sampling of liquefied petroleum gas. Copies can be obtained through the C. N. G. A. secretary, 1217 Associated Realty Building, 510 West Sixth St., Los Angeles, at 25 cents per copy.

## 1935 Estate Line Described in Catalogues Just Issued

The Estate Stove Co. has announced publication of its Catalogue No. 100 describing and giving specifications for the company's 1935 line of domestic ranges.

A special catalogue dealing with heavy-duty ranges for restaurant use, and Catalogue 97 covering its line of heatrolas, have also been issued. Copies may be had by addressing the company at Hamilton, Ohio.

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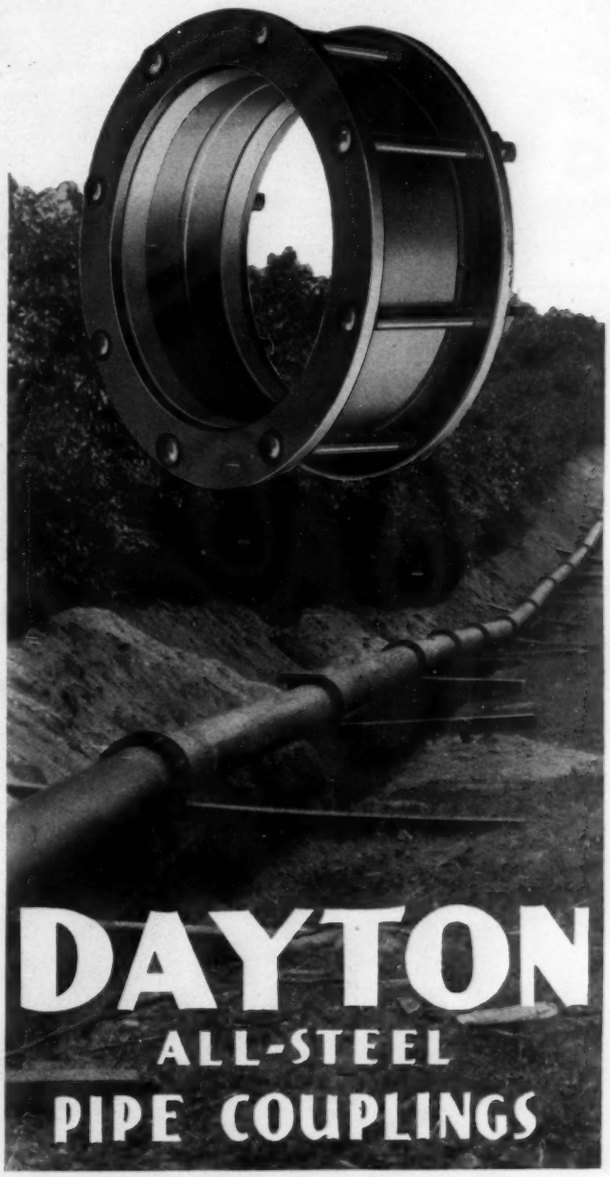
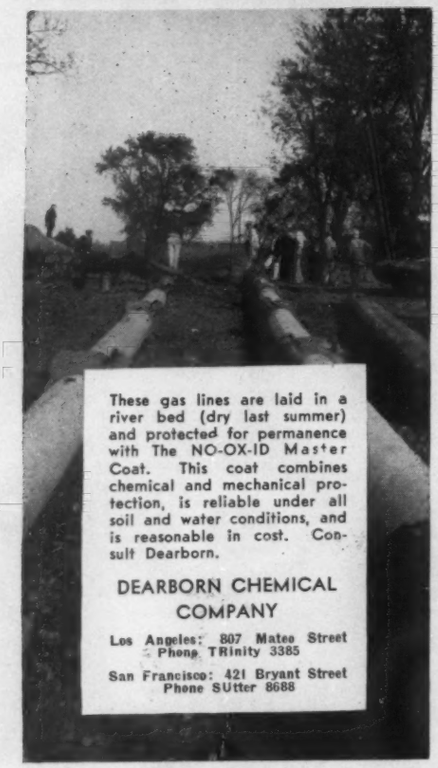


The NO-OX-ID MASTER COAT



These gas lines are laid in a river bed (dry last summer) and protected for permanence with The NO-OX-ID Master Coat. This coat combines chemical and mechanical protection, is reliable under all soil and water conditions, and is reasonable in cost. Consult Dearborn.

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# Gas Wastage in the Texas Panhandle, 1933-1934

TOTAL wastage of natural gas in the Texas Panhandle increased 76 per cent in 1934 over 1933 and on January 1, 1935, amounted to about 1.6 billion cubic feet daily, according to statistics released late in January by the U. S. Bureau of Mines. This wastage is considerably in excess of the quantity utilized daily in Texas for all purposes and exceeds by about 60 per cent the average domestic and commercial consumption of natural gas in the United States.

Nine pipe line systems originate in the field, six of which do interstate business. These lines have a daily carrying capacity of close to 900,000,000 cubic feet.

The total production of natural gas in the Texas Panhandle in 1934 was 876 billion cubic feet (daily average 2.4 billion cubic feet), an increase of 46 per cent over 1933. It is estimated that 167 billion cubic feet was wasted incident to the production of oil and gas. The quantity treated at natural gasoline plants in 1934 was about 644 billion cubic feet, an increase of 61 per cent over 1933. The total wastage of natural gas in the Panhandle increased from 275 billion cubic feet in 1933 to 483 billion cubic feet in 1934. On a daily average basis, the wastage probably increased from about 500 million cubic feet at the beginning of 1933 to about 1.6 billion cubic feet at the close of 1934.

The quantity of natural gas burned for carbon black in the Texas Panhandle increased from 136 billion cubic feet in 1933 to about 169 billion cubic feet in 1934.

Deliveries to pipe lines leaving the field are second only to carbon black plants in their demand for Panhandle gas. Daily average deliveries to pipe lines in 1934 (408 million cubic feet) were 15 per cent higher than in 1933.

The current production of natural gas in the Texas Panhandle is about 2.7 billion cubic feet daily, of which about 60 per cent is wasted. Most of the estimates of remaining recoverable gas reserves in the field vary from 10 to 25 trillion cubic feet, indicating a range of life of from 10 to 25 years, if the present production is maintained.

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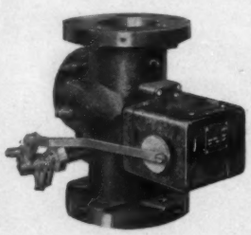
*Main Office and Factory*
Huntington Park, California
*Oldest and Largest Manufacturer of Gas Heating Appliances in the West*

## Minneapolis-Honeywell Regulator Co. Adds New Controls to Line

MINNEAPOLIS-HONEYWELL Regulator Co. announces the addition of new water circulators and flow valves to its line.

The water circulators are made for 1½-, 2- and 3-inch pipe sizes. Motors used in their construction are brushless type and silent in operation. These motors supply a high torque without heavy momentary line load which would cause a fluctuation in current supply for other purposes. They cause no radio interference.

Motors are spring mounted to prevent vibration noises and the shafts are oil sealed, eliminating packing glands. All sizes are flanged type with companion flanges.



The new flow valves for use with circulators or in summer-winter hot water supply systems are of the 45 degree swinging disc type, permitting installation in either horizontal or vertical position. The valve seats consist of brass rings pressed into the cast iron housings, and the valve disc is also of brass. The shafts are of stainless steel. Packing glands are of spring compression type. The valves are constructed with a manual operation feature, but may be equipped with motor power units if desired.

Complete information on the new circulators and flow valves may be obtained from the company at Minneapolis, Minn.

## 1934 Home Service Activities Successful in Milwaukee Area

A total of 145,569 contacts were made by the home service department of the Milwaukee Gas Light Co. in 1934. This figure embraced total attendance at regular and special lecture-demonstrations given in the home service auditorium, at organized group entertainments, at talks on gas appliances, those visited in regular home service calls, callers at the office of the director, telephone calls and contacts made through branch offices. Approximately 2,689,800 printed recipes were given out during the period.

Winter and spring lecture-demonstrations are to commence on February 4, according to Mrs. Ella Liner Lambert, home service director for the company, and will include a course in kitchenette cookery, designed especially for the business woman and for the prospective bride, a course for homemakers and a course in cookery for the discriminating hostess.

## Minneapolis Gas Light Co. Stock in Private Sale

A block of $778,000 first mortgage 4½ per cent bonds of the Minneapolis (Minn.) Gas Light Co. has been sold privately, through G. L. Ohrstrom & Co. The sale brings the company's total funded debt to $10,778,000 according to F. W. Seymour, president. Proceeds will be used partly to defray the cost of adapting the Minneapolis Gas Light Co. system for the distribution of a mixture of manufactured and natural gas.

## 1934 Maintains 1933 Safety Record

Public Service Co. of Northern Illinois, Chicago, maintained during 1934 the safety record of "no fatalities" established in 1933 by the company. There were only 20 accidents recorded over the entire system, for which Hugh Ptolemy is safety supervisor.

## West's Largest Steel Mill Natural Gas User

*(Continued from Page 18)*

low temperature for drying the coils of wire after the lime dip.

The wire galvanizing pot, 18 feet in length, is fired by 20 impact burners, firing against the wall of the pot, 10 of which are located on either side. The burner sizes and manifolding are arranged so that the temperature may be distributed as desired along the full length of the pot. Four manifolds on each side, running to alternate burners, permit the maintenance of an even holding temperature with a minimum gas consumption when the galvanizers are not in use. Wire produced includes annealed, galvanized, bright market, coppered and liquor finished, tie, welding, spring, strand, pipe winding, barbed, straightened and cut wire and twisted splice hoops.

The nail mill consists of 68 machines and produces nails from ¼-inch to 8-inch lengths. Nails manufactured include bright, galvanized, blued, cement coated, and pure copper. Wire tacks include bill poster, carpet and upholster, in sizes No. 3 to 20, inclusive. The nail bluing furnace is a revolving cylindrical retort into which gas is fired directly from a high pressure burner. The cylinder revolves in a firebrick combustion chamber where the flame of the burners is directed against a refractory bed.

Molding and core making equipment at the Columbia plant is also of modern type, with large concrete pits located in front of the furnaces to facilitate the pouring of large molds. These pit molds are heated by a gas flame from a portable burner.

The core ovens, which operate at a temperature of from 400° to 600° F., are fired by cast iron line burners which provide a continuous flame at floor level along the full length of each oven on both sides. Venting is accomplished through 4-inch pipe flues which come down through the roof of the oven and may be raised or lowered to control the temperature distribution. Operation of the core ovens is entirely automatic, with potentiometer instruments on each oven and the ovens turned on and off by a telechron clock which requires no attendant. As the cores are all baked at night, this has proven an important factor, as only with gas has it been found possible to rely entirely on automatically controlled ovens.

Many definite operating advantages have resulted at the Columbia Steel plant as a direct result of the conversion of virtually all the fuel burning equipment to natural gas firing. It has increased the thermal efficiency of the furnaces, facilitated the use of automatic control, has been much more convenient to handle than liquid fuel, and finally, has made possible a definite fuel saving throughout the plant.

---

### P.S.E.A. News Ceases Publication

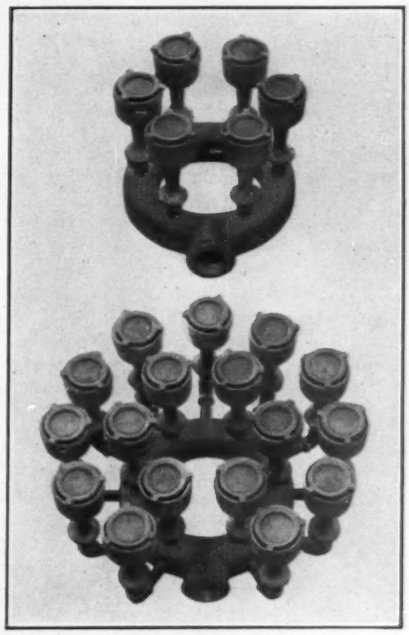
"P.S.E.A. News," official organ of the Pacific Service Employees Association, Pacific Gas and Electric Co. employee group, ceased publication with its December, 1934, issue, according to an editorial announcement in that number.

# N.G.E. TYPE 340 BURNER

In service stations, in dairies, at cleaners and dyers,—in fact, anywhere where a small vertical boiler is operated under moderately high pressure—the Type 340 N. G. E. Gas Burner is unexcelled. Designed primarily for this type of service, it is also successfully applied to other projects requiring an efficient, round, up-shot burner.

The correct number of heads can be supplied for gas capacities up to 850 cu. ft. of gas per hour. Each burner head has a capacity of 25 cu. ft. of 1180 b.t.u. gas per hour with a pressure of 6 inches of water.

As in all N. G. E. Gas Burners, there has been incorporated in the design the venturi principle of entraining a part of the air required for combustion by the pressure energy of the gas issuing from an orifice into the venturi throat of the burner. Investigate the Type 340 for your next small vertical boiler installation. Blueprints and full information upon request.



*ABOVE—Showing two N. G. E. Type 340 Burner Units illustrating the flexibility with which extra burners may be added to increase capacity.*

## NATURAL GAS EQUIPMENT INC.

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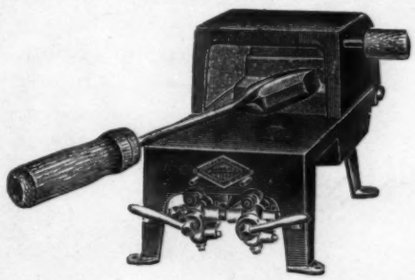

## Johnson No. 101 Soldering Furnace

This particular furnace is one of the most popular bench furnaces on the market. It heats soldering coppers, heat-treats, tempers, anneals, case-hardens carbon steel tools and small metal parts. Its remarkable efficiency is due to two powerful Johnson Bunsen Burners which furnish quick, intense heat without forced air blast. Write for full details.

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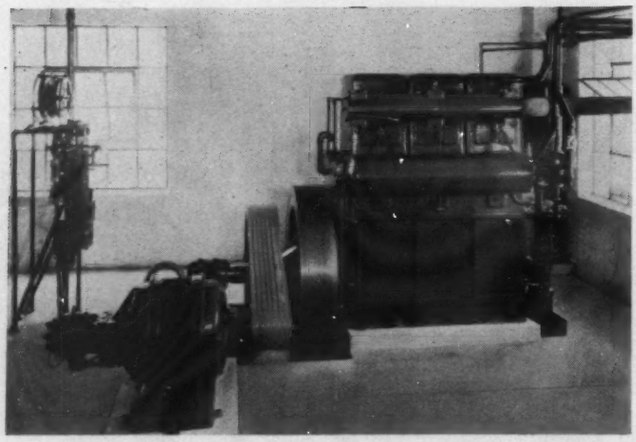


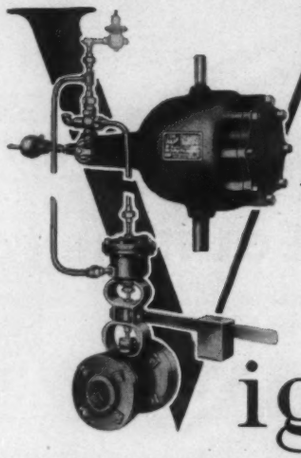
AT LEFT:
Cooper-Bessemer 3-cylinder natural gas engine, and generator, in plant of Dickson-Jenkins Manufacturing Co. Fort Worth, Texas.

## Another Instance of Natural Gas Engine Economy

WHEN a natural gas fueled engine reduced a monthly power bill averaging $360 to $370 a month to an average of $117 a month, as it did for the Dickson-Jenkins Manufacturing Co., of Ft. Worth, Texas, the management felt that they had taken a long step forward by equipping themselves to generate their own power. Now, after three years, the equipment has paid for itself and promises to serve with like economy for many an added year, demonstrating again the serviceability of the internal-combustion engine in the moderate-sized factory or commercial building.

The Dickson-Jenkins Co. manufacture high-grade work clothes and sports garments. Employing some 400 workers and using 350 motor-driven machines, not to mention its requirements of current for lighting and elevator service, the company was paying never less than $325 and sometimes as much as $500 a month to the local light and power company. In 1932 a 3-cylinder gas engine and an alternating-current generator were installed, with the result already indicated. The monthly saving, as reckoned by responsible officers of the company, is $240 to $260 a month, at which rate the investment involved would be cancelled in about three years. The figure of present cost, $117 a month, is made up of fuel, $94; lubrication, $8; and water, $15. It includes no labor charge because the time devoted has been only about one man-hour a day and the two general repair men regularly employed have been able to afford that without any hardship or neglect of other duties. There have been no repairs or replacements needed and it is not likely that any will be called for in the near future. Therefore, on an outfit that owes the company nothing, it has not seemed necessary to enter into any analysis of depreciation. Neither, on the other hand, does the quick comparison just given take account of the fact that the working force has been enlarged, that new machines have been added, increasing the motor load by 12 horsepower, and that the costs if the former method were still followed would have gone up, accordingly. Without weighing of trifles on either side, the case is clear enough.

The installation adopted was a Cooper-Bessemer 4-cycle vertical gas engine of 3-cylinder type with 11½-inch bore and 14-inch stroke, and an alternating-current generator with a direct-connected exciter, the engine being harnessed to the generator by a V-belt drive. The engine, though designed for normal rating of 135 hp. at 360 r.p.m., was reduced to 110 hp. at 330 revolutions, which was adequate for all anticipated needs. The plant operates 8 to 10 hours daily; on double shift it would show even better economy. The natural gas used as fuel costs 50 cents a thousand for the first hundred thousand cubic feet, 30 cents for the next hundred thousand, and 25 cents for all additional consumption.

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**FOR quiet operation at all times when demands are fluctuating, for sure and exact regulation under light loads as well as heavy, a Vigilant Liquid Level Regulator with V-port Valve is recommended. Wide-open, it has a capacity equal to that of the pipe. When flow is at minimum, V-port valve assures free throttling action.**

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**Or Any Jobber**


### C. V. Sorenson Succeeds Stanley Jenks at No. Ind. Pub. Service Co.

According to announcement by D. H. Mitchell, vice-president and general manager of the Public Service Co. of Indiana, C. V. Sorenson who has been engaged for many years in sales direction for the company and its affiliates, has been named general sales manager to succeed Stanley Jenks who recently resigned to become manager of the eastern division of the Bastian-Morley Co., appliance manufacturers at LaPorte, Ind.

Mr. Sorenson has been merchandise sales manager of the Public Service Co. of Indiana and at one time was manager of the old Interstate Public Service Co. property at Attica, having entered the utility field in 1914. He formerly was with the Wisconsin-Minnesota Light and Power Co.

### Merco Nordstrom Publishes New Service Chart for Valves

The Merco Nordstrom Valve Co., a subsidiary of Pittsburgh Equitable Meter Co., has recently issued a service chart describing under the headings, "Operation," "Adjustment," "Lubrication" and "Repair," the proper care for Nordstrom lubricating plug valves. The service chart is printed on heavy stock, suitable for tacking on the wall in operating headquarters or near Nordstrom valve installations. Copies may be obtained by addressing the company at Pittsburgh, Pa., or at branch offices throughout the country.

# More than seven million feet sold

Recent installation of Super-de Lavaud Pipe at Pelham, New York

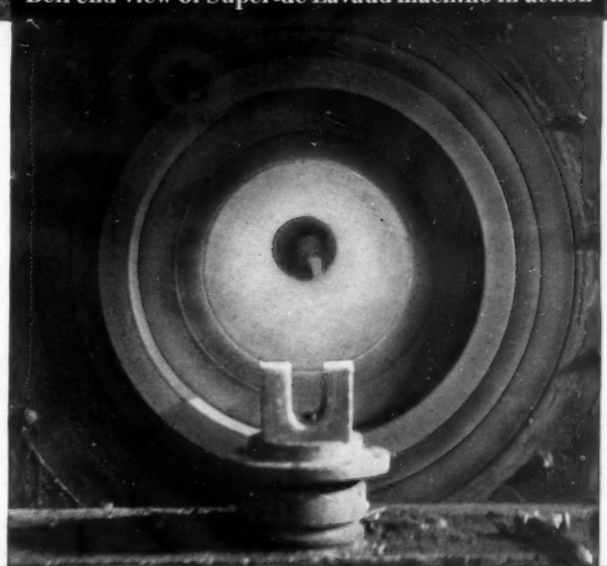
## *The Margin of Protection Against Damage in Handling has been Doubled*

Few products face the hazards of damage in transit, handling and distribution that cast iron pipe encounters.

By doubling the impact-resistance of Super-de Lavaud Pipe we have increased its inherent protection against these hazards to a point where they become a negligible factor. In the 22 months we have been shipping Super-de Lavaud Pipe, damage between plant and underground has been almost unknown. Yet during this period we have sold *more than seven million feet.*

Protected to the maximum against damage *above* ground, this tougher, more ductile pipe with doubled impact strength renders super-service *under* ground. It is made by a patented process in which the pipe is centrifugally cast without chill in a metal mold. For further information, send for booklet.

Bell end view of Super-de Lavaud machine in action



# U.S. SUPER-de LAVAUD PIPE

**CAST WITHOUT CHILL IN A METAL MOLD**

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MECOSTA

# A mile a day

with

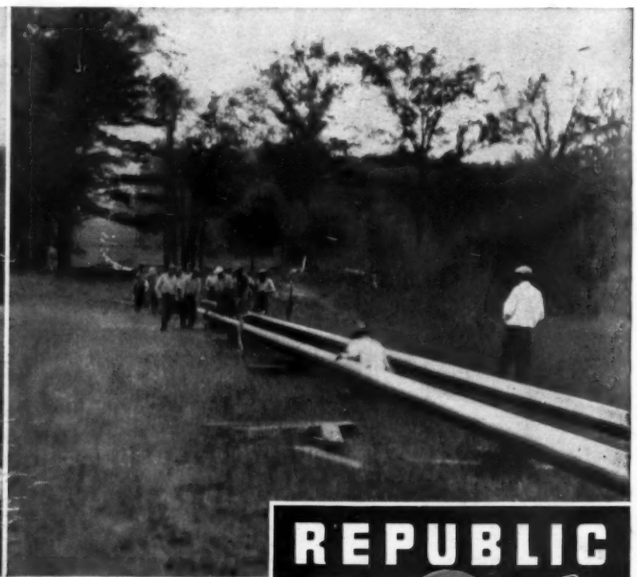
MUSKEGON

ON September 17, 1934, actual construction was started on a new 8-inch welded pipe line to carry gas from the Austin Field, Mecosta County, to Muskegon, Michigan. The line was laid at the rate of a mile a day until the 55 miles were completed, despite the difficulties. Swampy and boggy soil were encountered. Rotten stumps had to be pulled out with tractor and winch. And two 6-inch lines had to be buried three feet below the bed of the Little Muskegon River to provide a crossing for the line near Croton. Yet 550 men with the aid of Republic Electric Weld Pipe completed the work on schedule.

Republic Electric Weld Line Pipe saves time and construction expense on long and short lines —because it is round—because it is uniform in diameter and wall thickness—because it can be made in long lengths—because it is easy to bend and weld—and because its electric resistance weld is 100% free from defects. It is available in sizes up to 16-inch O. D., and can be produced fast enough to meet any pipe line schedule.

Let us send you complete information on this better pipe.

## REPUBLIC ELECTRIC WELD LINE PIPE IN MICHIGAN



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